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THE LUWIAN HIEROGLYPHIC CONTRIBUTION TO ANATOLIAN GEOGRAPHY

Fred C. Woudhuizen

The reconstruction of the geography of western Anatolia during the Hittite Empire period has been a hotly disputed subject, with widely differing views being ventilated in the course of time. It is true that the identification of place names like *Millawanda* and *Apaša* with classical *Miletos* and *Ephesos*, respectively, goes back to the days of Bedrich Hrozny™ (1929)[1] and John Garstang & Oliver Gurney (1959), but nonetheless Susanne Heinhold-Krahmer wrote her in-depth study of the western country, and later province, Arzawa (1977) without attempting to draw it on a map. A major step forward in the reconstruction of the geography of western Anatolia, producing unimpeachable identifications, was achieved by Heinrich Otten with the publication in 1988 of a treaty between greatking Tudhaliyas IV and his vassal-king Kuruntas of Tarhuntassa on a bronze tablet from Boğazköy-Hattusa. In this treaty the boundaries of the province of Tarhuntassa are meticulously described; as far as the western border is concerned, it is stipulated that in the region of the city of *Parha* this is formed by the river *Kaštaraya*—two names convincingly identified by Otten as classical *Perge* along the *Kestros* in Pamphylia.[2] As a side remark, it is added that the greatking is planning a military campaign against Parha and that, after it has been conquered, it will become part of the province of Tarhuntassa.[3]

A second milestone in the reconstruction of the geography of western Anatolia, and the first one provided by Luwian hieroglyphic sources, we owe to the merit of Massimo Poetto. In his publication of the Yalburt inscription, in 1993, he was able to establish on the basis of the correspondence of the place names *Pinata*, *Awarna*, *Talwa*, and *Patar* to epichoric Lycian *Pinale*, *Arñne*, *Tlawa*, and *Pttara*, that this text deals with a military campaign by Tudhaliyas IV in the valley of the Xanthos river in the western part of Lycia.[4] As explicitly indicated in the epilogue of the text, "in these lands the greatkings of Hatti, my fathers (and) grandfathers, no one has marched" (Yalburt, phrase 42), which in effect means that this region of western Anatolia is conquered by the Hittites for the first time. As I have argued in my own contribution to the interpretation of the Yalburt text, this also commemorates an earlier part of the same military campaign in the river land of *Luwata* and *Hwalatarna*, which for the correspondence of these names to classical *Loan-*

[1] See del Monte & Tischler 1978, s.v.
[2] Otten 1988: 37 (= commentary to VIII, 61).
[3] Otten 1988: VIII, 62-4.
[4] Poetto 1993: 78-81.

da and epichoric Lycian *Xbide* (= classical *Kaunos*), respectively, has a bearing on the valley of the Indus river situated immediately to the west of the Xanthus valley.[5] It is made very clear by the expression *apa muwaha* "I *re*conquered" (Yalburt, phrase 12) that this latter region of western Anatolia, in contrast to that of the valley of the Xanthus river, already formed an integral part of the Hittite Empire. (Note that from a geographical point of view the given sequence of affairs is fully understandable, as the mountainous terrain of the Xanthus valley is much more difficult to penetrate than that of the Indus river.)

A third major advance in the reconstruction of the geography of western Anatolia, and the second one based on Luwian hieroglyphic sources, comes from a recent article of John David Hawkins. In this article Hawkins brilliantly demonstrated that one of the well-known rock reliefs at Karabel, in the hinterland of Smyrna, is the product of a vassal-king of the land of *Mira*[6]—together with Kuwaliya in fact the successor-state of the aforementioned Arzawa after its defeat by Mursilis II in the years 3-4 of his reign.[7] As Hawkins himself quickly grasped, an immediate consequence of these stunning new readings is that the land of Mira (and before it that of Arzawa) stretches from the Anatolian plateau to the coast of the Aegean, and hence that the long standing identification of its capital Apasa with classical Ephesos is virtually confirmed.[8]

If we further realize that the identification of the country *Wiluša* with Homeric *Ilion* in the Troad is not seriously challenged,[9] there are for the completion of our reconstruction of the geography of western Anatolia only three countries left which need to be placed on the map: the *Šeha* river land, *Maša*, and *Karkiša*. Within the reasonably tight framework reached at in the above, space for these countries is only left in the Meander valley between Lukka and Mira on the one hand and in the Kaikos valley between Mira and Wiluša on the other hand. The clues for a decision in this matter are sparse. In the annals of Mursilis II it is recorded that Manapatarhundas, before he became ruler of the Šeha river land, had fled to Karkisa, which therefore may be considered as neighbouring country.[10] Another piece of evidence is offered by the so-called Manapatarhundas-letter, according to which *SARIPUTU*-men falling under the authority of the vassal-king of the Šeha river land were transported by a certain Piyamaradus from their residence in *Lazpa* (= the island of *Lesbos*) to presumably the city of Millawanda (=Miletos).[11] This might

[5] Woudhuizen 1995: 58-9; Woudhuizen 1994-5 [1996]: 173-4.

[6] Hawkins 1998: 4-8 (Karabel A). The name of the vassal-king, which is also known from bullae from Boğazköy, reads, with the goat's head sign *101 *TARKU* instead of the donkey-head *100 *TARKASNA*, *Tarkuwa-*. The inscription gives his genealogy up to the third degree, of which only the name of the father is readable as (with the bird sign *131-3) *ARA+li*—possibly a shorthand writing of *Alantallis*, mentioned as a witness to the treaty between Tudhaliyas IV and Kuruntas of Tarhuntassa (pp. 17-8). If so, the son Tarkuwas may have been a contemporary of Suppiluliumas II.

[7] Hawkins 1998: 10; 15 (with reference to Heinhold-Krahmer 1997).

[8] Hawkins 1998: 23.

[9] Güterbock 1986; cf. Hawkins 1998: 23; 31, fig. 11.

[10] Götze 1967: 67 f.; cf. Friedrich 1930: 5 (= Manapatarhundas-treaty).

[11] Houwink ten Cate 1983-4: 39-40 (KUB XIX 5); the city of Millawanda is not explicitly mentioned, but reference is made to Atpas, who, according to the Tawagalawas-letter, resided there.

argue for a northern location of the Šeha river land, close to Lesbos, but seems to conflict with a shared border with Karkisa if the latter is by and large identified, as seems likely, with later Karia. Similarly, in the annals of Mursilis II, again, the first known ruler of Mira-Kuwaliya, Mashuiluwas, is reported for year 12 to have fled to Masa, from which it might be deduced that these two countries share a common border.[12] None of these clues, however, are decisive, and it need not surprise us therefore that they have been variously judged.

Yet another clue, though, may be extracted from Hittite cuneiform sources. This concerns the career of Piyamaradus as recorded for especially the Manapatarhundas- and Tawagalawas-letters. As we have seen, the first records his deportation of *SARIPUTU*-men falling under the authority of the vassal-king of the Šeha river land from the island of Lesbos to presumably the city of Miletos. It is also stated here that he humiliated the writer of the letter, Manatarhundas.[13] In the second letter, the greatking (who is the author) complains that Piyamaradus constantly harasses "this land",[14] which on the basis of the context can only refer to some region in the hinterland of Miletos. Furthermore, the greatking appears to know that Piyamaradus is planning assaults on the lands Masa and Karkiya (= variant form of Karkisa).[15] Finally, if the greatking arrives in Miletos, Piyamaradus has left the city by ship.[16] From this information, one cannot help getting the impression that, from a geographical point of view, Piyamaradus' activity is bound to the east Aegean region. Perhaps a modest conclusion, but it actually excludes the location of Masa in later Bithynia, as Frank Starke proposed.[17]

We might look at the matter from a different angle of incidence. The Yalburt text proves that what the Hittites considered the *Lukka* lands (mentioned in the phrases 4 and 5) substantially overlaps with the later province of *Lycia*. Similarly, the identification of Mira in the rock reliefs at Karabel virtually proves the identity of Apasa with classical Ephesos and of Millawanda with classical Miletos. Why not assume, then, that Karkisa or Karkiya overlaps with classical *Karia* and that Masa overlaps with classical *Mysia* (note that the *a/u*-vowel change is paralleled for *masakana-* being the Luwian hieroglyphic indication of the *Muski*)? According to Herodotos and Thucydides, the Karians once lived on the islands of the Aegean before their movement to the mainland of Anatolia into their later habitat, the province of Karia.[18] Hence, they may at least partly still be situated on the islands before the Anatolian coast in the period we are dealing with, for which reason

[12] Götze 1967: 145.
[13] Houwink ten Cate 198-4: 9-40 (KUB XIX 5, line 7).
[14] Sommer 1932: 3-19 (KUB XIV 3 I 51; III 59).
[15] Sommer 1932: 3-19 (KUB XIX 3 III 53; IV 6).
[16] Sommer 1932: 3-19 (KUB XIV 3 I 61-2).
[17] Starke 1997: 451 for Masa "kommt nunmehr jedoch nur noch Bithynien in Betracht".
[18] Herodotos I, 171; Thuc. I, 4. According to Thucydides, the Karians were driven from the islands of the Cyclades in the times of Minos; Herodotos, on the other hand, is of the opinion that they served Minos when living on the islands, which necessarily means that their movement to the mainland dates from a later period. For the dating of the Minoan thalassocracy, which is embodied in the person of Minos, to the period *c.* 1550-1450 BC, see Woudhuizen 1992: 51-6.

we would position Karkisa or Karkiya here on the map. The province of Mysia is in its earliest attestations located on the coast immediately south of the Troad: thus Xenophon speaks of the Theban plain at the foot of mount Ida and Pergamon in the plain of the Kaikos river as places belonging to Mysia.[19] In line with this evidence, we would propose to place Masa in the valley of the Kaikos river. By means of deduction, this leaves us with the valley of the Meander river as the only possible location for the Šeha river land.[20]

The reconstruction of the geography of western Anatolia as proposed here (see Map I) coincides with the given clues from the Hittite cuneiform sources according to which the Šeha river land likely borders on Karkisa and Mira likely borders on Masa. The *SARIPUTU*-men from Lesbos, however, which fall under the authority of Manapatarhundas, the vassal-king of the Šeha river land, must in this reconstruction be considered Šehan settlers in a foreign country—by no means an implausible inference as it is in dispute to whom they are obliged to pay taxes!

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[19] Xenophon, *Anab.* VII, 8, 8. Note that the mention of Mysia in the Kypria as the scene of an earlier abortive attack by the Greeks against Troy probably refers to the same general area as well, see Loeb 57, Hesiod, The Homeric Hymns and Homerica, p. 493, and commentary to Hom., *Il.* XXIV, 765. Cf. also Strab. XII, 8, 1 (end section).

[20] Suggested already by Götze in 1957, see del Monte & Tischler 1978, s.v.

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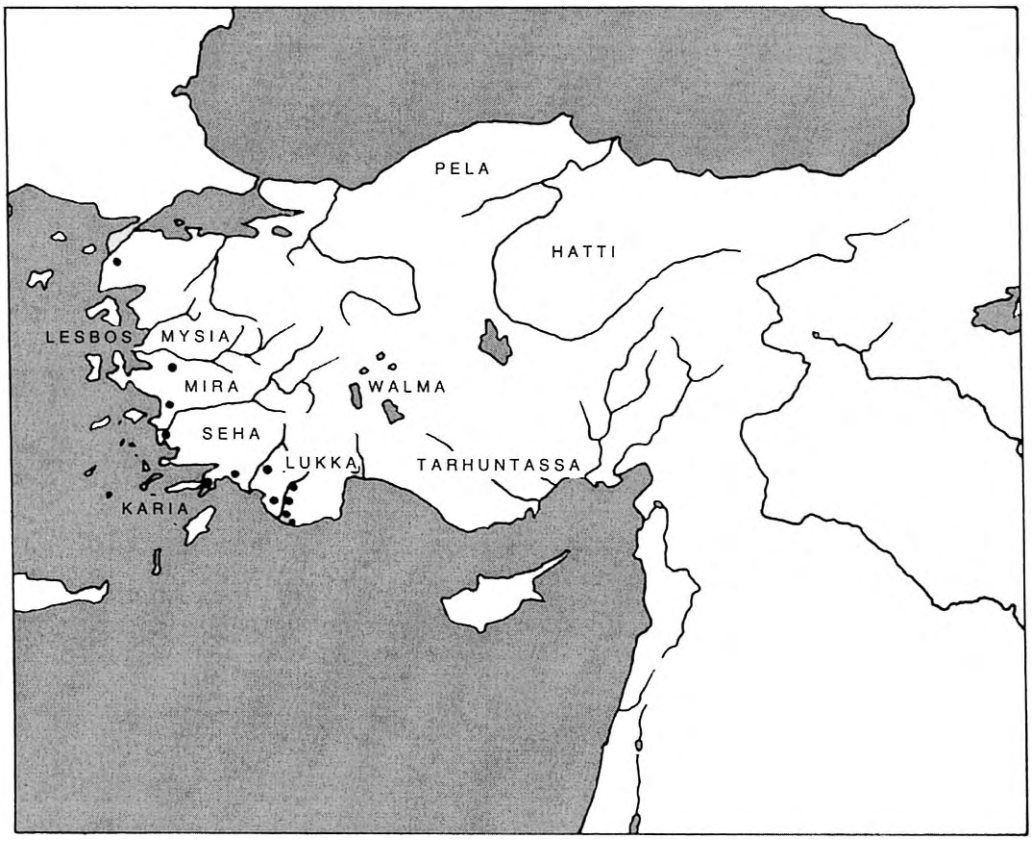

Map 1. Sites mentioned in the text. 1. Perge, 2. Oinoanda, 3. Tlos, 4. Arinna, 5. Patara, 6. Pinara, 7. Loanda, 8. Kaunos, 9. Miletos, 10. Ephesos, 11. Karabel, 12. Ilion; a. Kızıl Irmak, b; Kestros river, c. Xanthos river, d. Indus river, e; Meander river, f. Hermos river, g. Kaikos river

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DATING THE NEO-HITTITE KINGLETS OF GURGUM/MARAŞ

R.M. Porter

Abstract

Halparuntiyas III was a king of Gurgum, a Neo-Hittite state based at modern Maraş which is about 120km northwest of Carchemish. Halparuntiyas gave a seven generation father-son list of himself and six predecessors, inscribed in hieroglyphs on a monumental gate lion (fig 1). Some of his predecessors link to Assyrian history thus giving an approximate dating for the genealogy with Halparuntiyas III *c*.800 BC. However, the style of the lion is appropriate to the period of Tiglath-pileser III in the second half of the eighth century. The genealogical dating was published by Bossert in 1932, and the stylistic dating by Akurgal in 1949. A solution to the problem was attempted by Orthmann in 1971, but it was not favourably received. The discrepancy has now existed for over 50 years – this article restates the problem and reviews the literature but can not offer a precise solution.

The Maraş Lion and its Genealogy

The text with Halparuntiyas III's genealogy is known as MARAŞ 1. The genealogy can likely be extended back a further two generations by text MARAŞ 8, inscribed on a stela. Part of the genealogy of MARAŞ 1 is matched by another inscription on a statue fragment, MARAŞ 4. None of these three inscriptions were found *in situ*; all are conveniently illustrated by J David Hawkins in *Cambridge Ancient History: Plates to Vol.III*, pp.71-3, Nos.106-8. See also on Maraş, Hawkins in *Cambridge Ancient History* Vol.3, Pt.1 (1982; hereafter *CAH* 3/1), Ch 9 (especially p 383), and in *Reallexikon der Assyriologie* Vol 7 (1987- 90, pp 352-3), and for the texts with illustrations and historical commentary, Hawkins, *Corpus of Hieroglyphic Luwian Inscriptions Vol.I: Inscriptions of the Iron Age* (Berlin, 2000; hereafter *Corpus*), Ch 4 'Maraş'with pls 106-9, 112-13.

Table 1 shows the genealogies from the three inscriptions and the generally accepted links to Assyria, i.e. Shalmaneser III texts mentioning Mutallu and Qalparu(n)da in 858 & 853 BC respectively, and an Adad-nirari III boundary stela from 805 BC naming a Qalparu(n)da son of Palalam (A K Grayson, *Assyrian Rulers of the Early First Millenium BC, II (858-745 BC)*, Toronto, 1996, pp 16, 23, 205 respectively).

MARAŞ 1 (& 8)	MARAŞ 4	Assyrian sources
Astuwaramanzas (8)		
Muwatalis (8)		
Laramas I (1&8)		
Muwizis	Muwizis	
Halparuntiyas I		
Muwatalis	Muwatalis	Mutallu (Shalmaneser III 858 BC)
Halparuntiyas II	Halparuntiyas	Qalparunda (Shalmaneser III 853)
Laramas I		Palalam
Halparuntiyas III		Qalparunda (Adad-nirari III 805)

Table 1 Orthodox Scheme

The equivalence of Mutallu/Muwatalis and Qalparunda/Halparuntiyas is fairly obvious but for Palalam as an equivalent of Laramas II, the link is not fully understood (*Corpus* p 263). By Sargon's time Gurgum was alternatively known as "the land of Bit - Pa'alla" which may suggest that a Palalam (presumably Laramas I) was regarded as the dynastic founder (*Corpus* p 251, n 32). That the first Laramas may have been the founder of the dynasty is also suggested by the fact that his father and grandfather are not stated to be kings on MARAŞ 8.

The main work on Neo-Hittite sculptural styles is still Winfried Orthmann's *Untersuchungen zur Späthethitischen Kunst* (Bonn, 1971; hereafter *USK*). Orthmann arranged the sculptures into sequences of local styles and into general Neo-Hittite periods (see below), making what use he could of historical and archaeological information. On pp 203-4 he attempted to alter the above scheme; instead of putting the Halparuntiyas of MARAŞ 4 as Halparuntiyas II, he equated him with Halparuntiyas I and inserted a hypothetical Muwatalis (indicated with * in the table) into the MARAŞ 1 genealogy. This would result in the scheme shown in Table 2.

MARAŞ 1	MARAŞ 4	Assyrian sources
Laramas I		
Muwizis	Muwizis	
*Muwatalis	Muwatalis	Mutallu 858 BC
Halparuntiyas I	Halparuntiyas	Qalparunda 853
Muwatalis		Palalam
Halparuntiyas II		Qalparunda 805
Laramas II		
Halparuntiyas III		

Table 2 Orthmann's Scheme

Orthmann's reason for his scheme was that the style of the MARAŞ 1 lion shows Assyrian influence of a type usually dated *c*.Tiglath-pileser III, presumably post 743 BC when Tiglath-pileser defeated an alliance which included Gurgum. Orthmann argues as follows (paraphrased from the German):

A difficulty is caused by the dating of the MARAŞ 1 lion. According to Bossert [orthodox scheme] it dates in the last quarter of the ninth century. The style comparison with Zincirli forces the placement of the lion in a group that can hardly be older than Zincirli IV [a local style dated to Tiglath-pileser or later (*USK* p 221)], and thus not before the second quarter of the eighth century [better: not before the third quarter!]' (*USK* p 205).[1]

Thus, on the orthodox system Halparuntiyas III is dated *c*.800 BC, not post 743, but on Orthmann's scheme with Halparuntiyas II contemporary with Adad-nirari III, Halparuntiyas III can almost be dated to Tiglath-pileser. Hawkins briefly rejected this scheme in a review of *USK* (*Zeitschrift für Assyriologie* 63 [1973], pp 309-10). He objected that:

1) The 805 BC Adad-nirari III boundary stela was not known when Orthmann wrote. It gives Halparuntiyas as son of Palalam – hardly an equivalent of Muwatalis. (There may not be a problem if 'son of' is taken to mean 'descendant'; i.e. Halparuntiyas was descended from Palalam/Laramas I.)
2) Orthmann thought Muwizis on MARAŞ 4 was the grandfather of Halparuntiyas but the correct reading is great-grandfather, confirming the orthodox scheme (see also *Corpus* pp 256,258).

It should be added that:

3) Tarhulara was king of Gurgum by the time of Tiglath-pileser in 743 BC, not Halparuntiyas III.

Orthmann's scheme is probably wrong, but if the stylistic date of the lion is correct then the orthodox scheme can not be right either. There is no work on Hittite art that gives *stylistic* reasons for the lion being earlier than Orthmann's placement, and investigation tends to confirm that its style is late (see below).

Some extra room for manoeuvre might be gained if the inscription could be shown to have been inscribed by a son of Halparuntiyas III after his father's death. This possibility arises from the fact that a small ruler figure is illustrated at the beginning of the hieroglyphic

[1] There may be a misprint here. The German reads, "Der stilvergleich mit Zincirli führt aber zu einer Einordnung des [Maraş] Löwen in eine Gruppe, die kaum älter sein kann als Zincirli IV, eher etwas jünger, die also nicht vor dem 2. Viertel des 8. Jh. anzusetzen ist." The Maraş lion can not be 'somewhat younger/later' than Zincirli IV as this is the final style! One might suspect that Zincirli 'IV' is a misprint for III. This could then make some sense of the "2. Viertel des 8. Jh." which is certainly too early for Zincirli IV. If Zincirli III is meant, Orthmann would be saying that the style of the Maraş lion is more likely equivalent to Zincirli IV, but might be III. Both III and IV are within his general period *Sph* IIIb (*USK* p 148). Orthmann dates Zincirli III 'in the time around 730 BC' (p 221), which could presumably just be stretched back to the end of the second quarter of the eighth century. Whether a misprint is assumed or not, it is clear that Orthmann would see the natural place of the Maraş lion as after Tiglath-pileser's conquest.

text, intended to represent Halparuntiyas. Unfortunately the figure is badly damaged, but he appears to be standing on a lion which "seems to imply (posthumous) deification" (*Corpus* p 262, pl 113). If the inscription was posthumous, Halparuntiyas could have commenced his reign *c*.805 BC, died *c*.770 BC, and the lion could have been erected by Tarhulara (his son?) late in his own reign, *c*.740 BC. However, this requires long reigns for both kings and requires Tarhulara to commemorate his father (without mentioning himself) near the end of his own reign instead of at the beginning as would be expected. Perhaps the furthest that this type of argument can reasonably be pushed is to postulate a date for the lion inscription just after Halparuntiyas III's reign which might have ended as late as *c*.770 BC.

It may be possible to adapt Orthmann's approach, i.e. to question whether Halparuntiyas III's genealogical inscription is giving a true father-son consecutive seven generation sequence. Were some of the rulers brothers, or were brother rulers omitted? D Henige in Chapter 2 of *The Chronology of Oral Tradition* (Oxford, 1974) discussed 'The Problem of Extended Father/Son Succession'. He surveyed 660 documented dynasties from around the world and found that only nine had ten or more consecutive father-son direct successions (p 72). He said, "These data strongly suggest that the probability of more than eight or nine such successions is extremely low" (p 76). One might therefore guess that the six successions in the MARAŞ 1 genealogy would be slightly unusual but still plausible. However, more important are Henige's warnings about the nature of such genealogies; "Nor have ascendant genealogies [i.e. those running back up the genealogy from the last ruler, as here] often been recognized for what they usually are – simple legitimizing ancestral documents and not kinglists at all" (pp 77-8), and "The presence of unbroken filial succession implied strength, power, prestige, and continuity, and furthermore indicated that the state had *always* been strong and united. Ruling collaterals, therefore, tended to be forgotten, for they contravened this principle" (pp 80-1). Henige finished his chapter with, "it need scarcely be emphasised that an ascendant genealogy which does not claim to be more than that should under no circumstances ever be treated as a kinglist" (p 94) – as has happened with the MARAŞ 1 inscription!

Freed from the king list concept there may be other ways of achieving Orthmann's two generation adjustment. Some such adjustment seems little hindered by other evidence: Hawkins merely gives the reasons for linking Shalmaneser III to Halparuntiyas II as "satisfactorily identified" (*Corpus* p 251) and "Already identified by Bossert… and generally followed" (p 251, n 29). H Bossert had just assumed that the lion inscription was giving a direct father-son succession of seven generations (*Santas und Kupapa*, Leipzig, 1932, p 66). At this point suggestions for an alternative scheme might be expected. However, any such suggestion would probably be incorrect and would distract from the main aim here, which is simply to re-establish that there is a problem.

Stylistic Development of Lion Sculptures

It is generally accepted that ninth century Neo-Hittite lions have features largely derived from Empire period lions (e.g. tongue hanging out) whereas the Assyrianising lions

of the later eighth century have a fiercer, more realistic look, with different ears, etc. (e.g. fig 2). Unlike Assyrian lions, both groups of Hittite lions usually have the tail hanging forward between the hind legs, with a curl on the end. Assyrian influences are thought to have entered Neo-Hittite sculpture following Shalmaneser III's invasions *c.*850 BC, perhaps in concepts rather than details at that time (although the relief figure of Kilamuwa at Zincirli [*c.*840 BC] is an early example of a close copy of Assyrian style). Assyrian influence becomes more pronounced with Tiglath-pileser III's reconquests *c.*740 BC. This simplified general picture can be illustrated by comments from five authors (arranged in date order):

1) Henri Frankfort's well known *Art and Architecture of the Ancient Orient* (4th edn., 1970 but originally 1954) briefly touches on Neo-Hittite lions, and comments, "The earlier north Syrian lions are merely brutish [!]. But in the course of the eighth century they change their style and allow us to judge how strongly the closer contrast [*sic*; contact] with the Assyrian art of the Syrian palaces of Tiglath-pileser III influenced north Syrian sculpture" (pp 300-1 [p 181 in early edns.]). Thus he makes a distinction between the earlier and later lions, with Tiglath-pileser's expansion as the apparent cause of the change.
2) Ekrem Akurgal in *Art of the Hittites* (London, 1962, from which quotes are taken; see also German edns., *Die Kunst der Hethiter*, Munich, 1961 & 1976) says concerning the earlier lions:

> "Lion sculptures are the link between Hittite [Empire] and late Hittite art. Thus the lions of Sam'al (Zincirli), where there is least of the Hittite character, are, to begin with, purely Hittite. The older gate lions and those on the orthostat reliefs of Sam'al are Anatolian Hittite, like the lion sculptures of Carchemish; with their round, massive ears, gaping [better: half open] jaws, hanging tongues, and noses wrinkled at their lower edges they are faithful copies [better: derivations] of the gate lions of Hattusas" (1962, pp 127-8; 1976, p 93).

Concerning Assyrian influence on Neo-Hittite sculpture generally Akurgal makes some cautionary comments before making a division *c.*745 BC:

> "Assyrian influence in late Hittite art did not infiltrate uniformly everywhere. We can observe this process earlier in some localities than in others. One might speak of strong and slight Assyrian tendencies in various places. The degree of Assyrian influence, however, offers a safe starting point for chronology only within the same place, but not within [better: among] workshops of different principalities with disparate political orientation. More important still is the fact that during this period Assyrian influence penetrated in some cases indirectly, through the intervention of the Aramean peoples. On the whole a slight and a strong Assyrian phase can be noted. The first may date from about 850-745 BC, and the second from about 745-700 BC" (1962, p 130; 1976, pp 94-5).

For the later lions, in Akurgal's second phase of Assyrian influence (note that not all the features mentioned here are evident on the lions in fig 2):

> "The gate lions of Sam'al and Sakçagözü … are handsome examples of the Assyro- Hittite type of lion. They lack the most important characteristics of Hittite lions, i.e. the hanging tongue, the wrinkles on the lower ridge of the nose and the heart-shaped, stylized ears. Typical of this kind of lion with a strong Assyrian influence are the double and triple lobes of the ear, the wrinkled centre part of the nose, and the folds beneath the eye in palmette form. Typically Assyrian is the naturalistic rendering of the bodies which in the Hittite lions are also square [better: somewhat cubic]" (1962, p 135; 1976, pp 99-100).

3) Tariq Madhloom in *Chronology of Neo-Assyrian Art* (London, 1970) notes that lion gate sculptures were first adopted in Assyria in the time of Assurnasirpal II (883-859 BC) and may have originated from North Syrian models (p 101). He makes a division between lions of the ninth century (examples are given from Carchemish, Zincirli and Hama) and those from the second half of the eighth century (examples from Sakçagözü, Tainat, Göllüdag and Zincirli) (p 101).
4) In Winfried Orthmann's *Untersuchungen zur Späthethitischen Kunst* (Bonn, 1971), Neo-Hittite sculptures were periodised into *Spätehethitisch* I, II, IIIa & IIIb (i.e. Neo-Hittite I, II & III; abbreviated '*Sph*'). Orthmann did not clearly spell out dates for these periods but he seems to have had in mind that *Sph* II would cover roughly 950-850 BC (p 221; see also table on p 148). Orthmann's chapter on Neo-Hittite art in a recent multi-author work, placed the beginning of the third phase slightly later, not at *c*.850 but 'towards the end of the ninth century BC' (*Die Hethiter und ihr Reich*, Bonn, 2002, p 278).

A section on lions would be expected in Chapter 7 of *USK*, but they are excluded, perhaps due to Akurgal's previous extensive treatment of the subject in his *Späthethitische Bildkunst* (see below). In pp 159-161 Orthmann compares Neo-Hittite and Assyrian animal styles. Page 160 says that 'in the *Sph* I-II periods lion representations are wholly in the Hittite tradition and show no Assyrian influence', and 'in *Sph* III numerous influences from Assyrian lions are seen'. As examples of these Assyrianising features Orthmann lists; the ears, head proportions, belly hair and lack of protruding tongue. Thus Orthmann also makes a division between the earlier Hittite style lions and the later Assyrianising lions but with the division placed earlier than Akurgal, at *c*.850 BC (*USK*) or late ninth century (*Die Hethiter und ihr Reich*).

5) J David Hawkins in *Cambridge Ancient History* Vol 3, Pt 1 (Cambridge, 1982), pp 436-7 summarises Neo-Hittite sculpture using Orthmann's scheme. He writes that *Sph* II "bears a certain, but still controversial, relationship to the beginning of Assyrian relief sculpture"

and that *Sph* IIIa & IIIb "show increasingly strong Assyrian affinities". He dates these periods (p 436): *Sph* II *c*.950-850 BC, *Sph* IIIa *c*.850-750, and *Sph* IIIb *c*.750-700. Thus he also sees a weak link to Assyria followed by a stronger link. He has Tiglath-pileser influencing only the final IIIb phase and places the inscribed Maraş lion earlier, in *Sph* IIIa, in agreement with its orthodox dating *c*.800 BC. Hawkins does not give stylistic reasons why the Maraş lion should be *Sph* IIIa rather than IIIb, since he regards this dating as proven by the textual evidence (*CAH* 3/1, p 383).

The tendency of some of the above authors to divide Neo-Hittite lions between the first half of the ninth century or earlier and the later part of the eighth may be too simplistic. It has to be remembered that Adad-nirari III (810-783 BC) was active in this area, presumably continuing to bring Assyrian influence, and that during the entire period from 850 to 740 BC many of the Neo-Hittite and Aramaean kingdoms may have prospered and continued to develop varying sculptural styles. Orthmann and Hawkins place *Sph* IIIa roughly covering this period whereas the others seem to have some degree of gap.

In the *Sph* IIIa period should come Shamshi-ilu, the increasingly independent Assyrian *turtanu* from the time of Adad-nirari III onwards. He had a pair of gate lions erected at Til Barsib/Kar Shalmaneser on the Euphrates (perhaps *c*.774 BC [R Barnett, *CAH* 3/1, p 346]) which seem to be a local North Mesopotamian product. They have a number of Assyrian details typical of the statuary and reliefs of Assurnasirpal II and Shalmaneser III (e.g. tapering hair ruff, features around the nose, realistic paws, belly hair, thigh muscle, etc) but their general shape and stance are not Assyrian (e.g. oversize head which rises above the block, lack of the Assyrian extra leg, tail between rear legs [restored]). These features were analysed by Arlette Roobaert in G Bunnens [ed], *Tell Ahmar: 1988 Season* (Leuven, 1990, pp 126-135). She summarised the lions as "a local North Syrian product bearing almost all [better: many of] the stylistic characters of Ashurnasirpal II's style" (p 132).

The Place of the Inscribed Maraş Lion (fig 1)

There are two quite similar gate lions from Maraş. The inscribed lion (Orthmann's B/1) is significantly smaller than the other (B/2) so they are not a matching pair, but Orthmann notes such strong similarities that they must date from approximately the same time (*USK*, p 89). On the same page he also notes that the style of these lions can not be dated with respect to other Maraş sculpture but only by comparing with lions from other sites. In this connection it should be noted that H Genge's *Nordsyrische- südanatolische Reliefs* (Copenhagen, 1979), although having a chapter on other Maraş sculptures, does not cover lions. Also, the small ruler figure which introduces the hieroglyphic text is, unfortunately, too damaged to use for stylistic comparisson.

In *USK* pp 524-6, the Maraş sculptures were categorised as in Table 3 (B/numbers are Orthmann's).

KINGSCULPTURE	(TEXT)PERIOD
Laramas IB/16	(MARAŞ 8)*Sph* II
Muwizis	
Halparuntiyas I	
Muwatalis	
Halparuntiyas IIB/3	(MARAŞ 4)*Sph* II/IIIa [perhaps better IIIa]
Laramas II	
Halparuntiyas IIIB/1	(MARAŞ 1)*Sph* III [perhaps better IIIb]

Table 3 Stylistic Periodisation

In Table 3, MARAŞ 4 is shown in the orthodox position whereas Orthmann would place it with Halparuntiyas I (p 205). Although Orthmann gives *Sph* II/IIIa for MARAŞ 4, other indications in his book suggest that it is more IIIa than II (in terms of local style it is 'definitely Maraş II' [p 524] which on p 148 is tabulated as *Sph* IIIa). Similarly with MARAŞ 1, except for the historical problems, he might have happily dated it *Sph* IIIb (e.g. on p 139 his closest comparissons are to the latest lions at Zincirli and Sakçagözü). Despite these criticisms, the ruler sequence is in reasonable agreement with the stylistic sequence. It remains to investigate further whether the style of the Maraş lion truly dates from the time of Tiglathpileser III in the second half of the eighth century, i.e. that it is *Sph* IIIb.

On p 139 of *USK* Orthmann briefly compares the Maraş lions with those from other centres, especially Zincirli and Sakçagözü both of which are within about 75km of Maraş. He finds a close comparison of the head and mane with Zincirli H/3 and somewhat with Zincirli C/4&5 (fig 2 shows C/5 on the right). The slender body he compares with Zincirli J/1 (misprinted as J/2) and Sakçagözü A/3. With the exception of the weaker comparison to the pair C/4&5 which Orthmann allocated to *Sph* IIIa (between the local styles Zincirli II and III [p 544; see also chart on p 148]) these lions are all *Sph* IIIb (Zincirli III or IV [pp 548-9]; Sakçagözü II [p 530]). As mentioned above, it was this late placement of the Maraş lion which caused him to attempt to lower the dates of the genealogy by two generations, otherwise there would have been a strong Assyrian influence on lions at Maraş at a very early date (*c*.800 BC). Such early strong Assyrian influence on lions at Maraş is unlikely because the strong Assyrian influence would have had to bypass Til Barsib where Shamshi-ilu would have been erecting old fashioned lions in the Assyrian regional capital!

In Akurgal's *Späthethitische Bildkunst* (Ankara, 1949), in the section '*Löwendarstellungen*' (pp 39-76, with conclusions by period on pp 70-76) he deals with 16 different lion features under sub-headings. In these sections he often has the later Zincirli, Sakçagözü and Maraş lions and a few others, as an Assyrianising late group which he refers to as *jungspäthethitischen* (shown in his figs 41-7 & pls 27-37). This is the case particularly for ears (p 41, p 52 n 47), mane (pp 45-6), eyebrows (p 51), nose shape (p 54), tongue (p 52 n 47) and shoulderblades (p 63). In two cases the inscribed Maraş lion lacks the late features. The late group generally has long wrinkle lines under the eyes (presumably an effect of snarling) but the

inscribed lion from Maraş does not have these, although the other lion from Maraş does. This feature and another divergent aspect of the nose wrinkles are dealt with on pp 52 & 54 but on both pages Akurgal adds a footnote to emphasise that the inscribed lion is nevertheless included in the late group (nn 47 & 61). Thus there may be scope for suggesting, as he does, a slightly earlier date for the inscribed lion compared to the larger one from Maraş and others in the late group. However, the general similarity in appearance of the two Maraş lions suggests that the difference in time is slight. Akurgal summarises the late group of lions on pp 74-6. They are strongly Assyrianising and he divides them into three phases. The first phase includes the inscribed Maraş lion and the second the uninscribed Maraş lion. Akurgal puts all three phases roughly in the period 730-700 BC, presumably assuming the influence of Tiglath-pileser III's conquests.

Thus, both Akurgal and Orthmann, who studied this subject in the most detail, place the style of the inscribed Maraş lion too late for the conventional interpretation of its inscription and consequent dating. Although Orthmann tried to overcome the problem, others have just ignored it. Something has to move.

Fig. 1. The inscribed Maraş lion (after K. Bittel, *Die Hethiter*, Beck, Munich, 1976, p 275).

Fig. 2. Two Zincirli lions as arrangend in the Berlin Museum. The left lion, actually a replica, is an example of Orthmann's *Sph* II period, probably ninth century. The lion on the right has Assyrianising features and belongs in *Sph* III, eight century.

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EARLY SETTLEMENT IN THE PLAIN OF YENIŞEHIR (NW ANATOLIA)
The Basal Occupation Layers at Menteşe

J. Roodenberg, A. van As, L. Jacobs, M.H. Wijnen

THE FIELDWORK
by J. Roodenberg

Introduction

Since 1987 a multidisciplinary research project is being carried out in the eastern Marmara region to study early farming communities. Fifteen summer seasons have been spent to investigations at Ilıpınar Höyük including next to purely archaeological work, landscape studies, analyses on human, botanical and faunal remains and dating techniques. Within the framework of this project, limited excavations were carried out on the mound of Menteşe situated in the Yenişehir plain ca. 25 km south of Ilıpınar. With a final campaign in 2000, fieldwork at Menteşe was concluded. As it was meant from the outset as a rescue excavation under the auspices of the Museum of Iznik, it had purposely kept the scale of a sounding. Three preliminary reports have been published on previous work at Menteşe, one dealing with the archaeological data (Roodenberg, 1999) and two with human remains (Roodenberg-Alpaslan, 1999, 2001). The current article links the occupational evidence from previous seasons with the stratigraphy and findings from the basal layers uncovered in 2000. In addition, a technological and typological analysis is presented of the most important find category of basal Menteşe – the pottery. In conclusion, an appraisal is given of the position of this settlement in the chronology of the Marmara region (fig. 1).

The deep sounding of basal Menteşe was carried out along the northern and eastern section of square K15 where the virgin soil was reached. This L-shaped area was chosen because of good evidence for occupation debris. Apart from a 1.5m thick layer almost entirely composed of midddens from Roman, Bronze Age and Chalcolitic periods (stratum 1) preceded by a thin band of black ashy surfaces – the cultivated fields period (stratum 2), the soundings from the former fieldwork in 1997 had revealed groundplans of three buildings (top of stratum 3). Their walls had consisted of either pisé or mud slabs for the lower part and of wattle-and daub for the upper, evidenced here and there by thin (carbonized) wooden posts and imprints of wickerwork in the mud (fig. 3). In addition, at the same time mud-brick constructions seem to have occured as well. Although the groundplans for the greater part extended outside the excavated area, there is little doubt

that the buildings resembled the ordinary dwellings from Ilıpınar's earliest levels. These dwellings consisted of a ca. 30m^2 building surface with walls of mudslabs or of timber posts enclosing a single room with spaces for living and cooking (Roodenberg, 1993:253). The 'burnt house' of Menteşe was formerly described (idem, 1999:24). Most remarkably this building yielded the first traces of wattle and daub walling ever encountered since excavations in the Iznik-Yenişehir area had begun. It seems these walls consisted of a lower wall base made of pisée for which dark grey loam was used. In these walls, which were preserved at an average height of 20 cm, thin posts or stakes (ca. 5cm in diameter) were planted at 10-15cm wide intervals. From a wickerwork of horizontally twisted branches no impressions were left, but long stretches of mud coating curling around the posts were still visible. The outside of the walls consisted of yellow clay – probably the remains of a coating that had been smeared all over the exterior of the building. The inner floor was smeared with mud plaster resulting in a hard and smooth surface where a few pots were standing in situ. Its northern half was largely destroyed, among other things by the pits of burials UF and UH. According to stratigraphic evidence these burials – both of male adults – should be linked to an occupation level that rather closely followed the destruction of the dwelling. Two more buildings belonging to the same occupation level were found Northwest of this dwelling. Their southern walls – the only building parts visible in the trench – were made of blocs cut from natural clay deposits called mud slabs set on a surface that gently sloped up to the west. At the corner of the eastern-most building a portion of the courtyard was preserved showing mud-plastered installations for food storage and processing. From this occupational horizon, which constitutes the top of stratum 3, the sounding of the 2000 season occurred.

Deep sounding

For reasons of time the deep sounding of basal Menteşe had to be restricted to the former trench SSK15, measuring 9 x 3 m, which was enlarged by an extention to the west of 4 x 2.2 m along the northern section of square K15 (fig. 2). As stated above, the 1997 fieldwork had exposed three contemporary buildings that belonged to the top of stratum 3 occupation, the most western of which laid outside the sounding area of the 2000 season. Inspection of the northern section of the deep sounding revealed a succession of three buildings shown by yellow clay floors (fig. 4). The upper one, known from the 1997 dig, had two floors and was constructed on a levelling layer of grey earth. In fact, the 'burnt house' corresponds with the upper ones whose eastern part was eroded. While the northern sounding area was a build-over area, the eastern part seems to have been constructed only once. The 'burnt house' had no predecessors. Underneath its floor level, two burials were uncovered, UF and UH, both containing the skeletal remains of a male adult. By chance, burial UH's imprint is engraved in the eastern section demonstrating that the pit was dug through the destruction layer and floor of the house, but was overlaid with ash lenses of stratum 2 (fig. 4, East section). Hence the moment of their inhumation must be fixed between ca. 7100 and 6800 BP. Probably connected to the burnt house were the

burials UJ and UK, respectively belonging to a child and a young woman. It is thought that these individuals were intentionally inhumated under the house floor (fig. 4, East section). The bodies lay ca. half a meter under the floor, the woman in what may have been a wooden chest, which not only had pieces of horizontal planking preserved but also fragments of wooden uprights, while the skeletal bones were covered with fibrous fragments of decayed wood. Next to a sheep horn and scapula, the deceased was found with a terracotta box near her chest (fig. 5a). The box, square in shape, stood on four legs and had a horizontal handle which was broken. It was decorated with incised and incrustated geometric motifs on three sides (fig. 5b). The woman wore a necklace judging from the many tiny stone beads that were found at the place of her neck (fig. 6). Burial UJ was from a ca. 2 year-old child. There were also a scapula and a horn positioned near the body. Moreover, five thin, square bone plates, each of them pierced by six holes were found on the body (fig. 7). There is no conclusive evidence for linking the child and the woman; although the burial pits had been dug one next to the other at equal depth, viz. 80 and 90 cm respectively. However, the apparently special care to surround these burials, and their close position both vertically and horizontally may strengthen the idea of kinship. If this is true, then the suggestion that the deceased were buried under their own dwelling is likely. It would be the first time that intramural burials (in the sense of 'within a building', and not as often wrongly stated 'within a village') can be established in the Iznik-Yenişehir region. There were more house floors and burials uncovered during these soundings at Menteşe, but no such potential connection could be observed a second time.

Stratigraphy

When examining the northern and eastern sections of the sounding area, one discovers some regularities in the stratification of the debris: inner surfaces (house floors) and outer surfaces (courtyard floors) are often, but not always, provided with a 3-5 cm thin level of yellow clay. This floor was applied on a compact layer of grey to brown clay whose function was to level an uneven subsoil and constitute a firm foundation for a walking or living surface. As it appears, a second regularity is that a higher frequency of finds (these may be pottery sherds, stone, bone or flint tools and chips, debris from meals and butchering) occurs in relation to the above-mentioned surfaces. The exception was that inner floors were usually void of finds, while the corresponding courtyards were rich of such debris, not only laid on the surface but also trampled in the ground. Statistic processing of mobilia provides evidence for such surfaces that rather well corroborates with what the sections demonstrate. The northern section shows the succession of five such surfaces. The upper surface (with a refection a few centimers below) is the floor of a building (north section building 1= nsbl) whose east corner was cut by ancient ploughing and whose western wall is not visible in the section (fig. 4). The building was overlain by a thin layer of black and red burnt building debris. This layer can be observed in the eastern section as well, where it overlays a courtyard surface and the floor of the so-called 'burnt house'. The walls of this house are not visible in section either.

The next building (nsb2, see projected transverse wall AF) according to the northern section had its floor ca. 40 cm below the floor of the upper one. This is the one that is shown in fig. 3 together with the burnt house and a third one to the west (nsb3). However, the eastern section does not show a matching building, because during the period preceding the burnt house this sector appears to have been an open space. The third building was found (nsb4, see projected transverse wall AH") 20-30cm beneath it, its loam floor resting on a somewhat loose brownish mottled soil. From this level down to virgin soil (ca 2.20m) a succession of burnt occupation debris alternating with trodden surfaces, some paved others unpaved, most of which can be tracked in the eastern section. Usually these surfaces yielded larger quantities of finds. For the convenience of tracing pottery development in the accumulation of destruction and building levels of basal Menteşe, a distinction has been made between

upper occupation levels (levels 100-109)
middle occupation levels (levels 110-125)
lower occupation levels (levels 126-130)

The lower occupation levels consist of 1 to 1.50 m of debris above virgin soil, the middle occupations levels contain the most distinct courtyard surfaces, while the upper occupation debris include three building levels (North section).

The use of space

Though visible in section the yellow mud floor of the lowermost building was hard to recognize at the surface (fig. 8, plan nsb4). This was also true for the eastern and western walls which, moreover, did not leave contours in the section. Its nearly 6 m long southern wall (AH), however, could be easily traced, not least because of a neat row of charred stakes set at irregular intervals in the mud slab or pisé foundation wall. This foundation wall, preserved at ca. 20 cm high and on avarage 20 cm wide, bore a thick coating of yellow mud along its outside (fig. 8, wall sections). Such loam was noticed on walls of esbl and nsb2 as well, and probably the exterior of all buildings was coated likewise. The yellow colour of the coating refers to clay that was not polluted with household refuse but was extracted from natural deposits. In addition, burnt pieces of this loam demonstrated that it was free of vegetal additives. In line with the construction level of this building, a trodden surface can be distinguished in the eastern section extending south. Judging from three postholes found south of the building's SE corner the yard seems to have been confined by a fence running parallel to the southern wall. An example of a trodden surface consisting of clay patches, burnt rubble and ash lenses is given in fig. 9. Although no special surface treatment was apparently applied, this area was used as an activity zone judging from concentrations of stone bolders, a grinding slab and a stone with a shallow hole (door socket?). Burial UL comprised the remains of an infant that was dumped in the building debris.

While digging down, more such surfaces were encountered, some neatly paved with plaster. No structures were recognized except one. At a depth of half a meter above

the virgin soil in the northeastern part of the trench stood a structure: a fragment of thick mud footing with one side turning into a blunt angle and with two rows of thin posts, one along the inside of the footing, the other running in a sharp angle with the former (fig. 10). Big pieces of walling, apparently broken off from the footing laid in front of this structure. The surrounding surface as well as the described parts were heavily burnt. Though the groundplan is rather odd, these were probably the remnants of a storage device. One post yielded a radiocarbon sample. The deepest man-made deposit above virgin soil was built up of half a meter of clayish levelling layers alternated with ashy trodden surfaces; there were no traces of burnt building debris.

Considering that from a settlement of approximately one hectare only a minute surface of stratum 3 has been investigated, not much can be told about how space was used in the village. Yet, as the area of excavation constitutes the heart of the settlement mound, the mere fact that vacant areas were frequent horizontally and vertically, suggests that the village ground was not density built. The same may be deduced from the lack of repetitiveness of building over the same parcel. Rebuilding on the same plot was customary during Ilıpınar's early phases, when up to eight times parcels had been built over with similar dwellings (Roodenberg, 1995). In contrast, only three successive buildings were counted in the sounding of Menteşe: nsb1, 2 and 4 along and underneath the northern section, while the burnt house along and underneath the eastern section had neither predecessor nor successor. Yet, the heavy deposits of refuse and debris noticed in the sounding trench prove the nearby presence of habitation. The thin black lenses noted as stratum 2, which were visible all over the sections, give the impression that at that time the village ground was entirely taken into cultivation: no traces of building, neither debris, nor even adduction of earth. From the levels of stratum 1, which were dug in a much larger plan, no clear picture could be made about village development (supra).

From basal Menteşe evidence of five buildings was collected, four of which could be partially investigated horizontally. Walls found preserved up between 20 or 30cm maximum were made of pisé or mud slabs. Sometimes traces of wattle-and-daub were noticed on top. This may imply that these walls were mere foundations for wickerwork walling. Whether this is true for all walls can not be confirmed. Still, their preservation at equal height may be understood as an indication in that direction. However, the presence of a six-course high mudbrick wall in the southern section of the sounding trench demonstrates the simultaneous occurrence of different building modes in stratum 3. The orientation of the buildings is due NS-EW. The wall length of the various building plans runs from 5 to 6 m and corresponds with house plans from Ilıpınar X to VIII. Inner floors are plastered with yellow loam, as well as the exterior of the walls. The building plans exposed in the sounding area were too incomplete to conclude on the arrangment of the inner space, such as bins and ovens. The least one can say is that such installations occurred at the outside, as is evidenced by cooking and storing structures at the SW corner of building nsb2. The burnt house is the only building where heavy posts stood in the inner space. These posts, of which the biggest yielded a charcoal sample for radiocarbon deter-

mination, were thought to have supported the roof. An idea that can not be corroborated by the other buildings, because of their groundplans largely lay outside the sounding area.

Burials

Altogether eleven burials were excavated during the field season of 2000. Added to the burials found in the previous season, a total of 20 individuals was reached. Since these human remains have already been extensively described (Alpaslan-Roodenberg, 2000; Alpaslan-Roodenberg e.a., 1999), we will confine ourselves to contextual information. Apart from this, a burial in the upper levels of the mound comprising few skeletal remains on a stone paved bed was erroneously ascribed to the Roman period (Roodenberg, 1999:29). We acknowledge colleague Jürgen Seeher's comment that it better suits the Early to Middle Bronze Age stone chamber tomb tradition known from the Eskişehir region.

Whenever visible, the contours of burial pits as a rule could be traces at skeletal level. It was rarely recognized at the surface from where the pit was dug down. Being aware from direct and indirect evidence that the depth of these pits varied between 50 cm to 1 meter below the surface, we are able to approximately assign the individual burials if not always with certainty to the distinct surface levels then at least to the corresponding (sub)period. As a result, we reckon ten burials to the upper stratum 1, none to stratum 2, and the remaining ten to stratum 3, provided that burial UH was dug from the top of stratum 3 as shown in the eastern section; UF probably likewise, while the other burials had been dug at various levels of the basal occupation debris. As has been shown above, a young woman and child (UK and UJ) were presumably inhumated below the floor of their dwelling. These graves as well as the double burial UM-UP, which contained the remains of a female of over 40 resting with a child aged between 10 and 14, showed evidence for funeral rituals as there were sheep horns and scapulas placed near the deceased. This is remarkably different from the infant corpses from basal Menteşe, which had been carelessly dumped in occupation debris. Burials with gifts also occurred among the group from stratum 1 : a man, aged between 31-34, with a clumsily made pot near his face, and a woman between 23 and 34 also with a pot, resting on wooden planking. Furthermore, a 3-5 years old child wearing a necklace with stone beads. The majority of the dead rested on their left side in a Hockey position with moderately to strongly flexed legs and hands joint near the face. All were primary burials. Although a considerable lapse of time distances the earliest burial from the last, maybe by a thousand years, no changes in funeral practice were perceived.

All radiocarbon determinations (fig. 11)

Stratum 3

This stratum is referred to as 'basal Menteşe. Nearly 3 m of basal occupation deposits have been dated by nine radiocarbon determinations running from 7550±50BP to

7050±35 BP. Eight of them, since they were sampled in the sounding area, are projected on the sections (fig. 4). The results provide a regular distribution of determinations from the successive layers. Despite the fact that the number of processed samples comparing to the sequence of Ilıpınar is rather small for determining the age of a 3 m thick occupation deposit, this consistency adds quite some credit to the reliability of the overall age of basal Menteşe.

Stratum 1

To complete the chronological picture, the samples from stratum 1 were added. The upper half of the mound's stratigraphy (we leave flimsy Bronze Age and Roman vestiges out of this analysis) is represented by a thus-far badly understood Early Chalcolithic occupation of stratum 1, approximately determined between 6800 and 6600 BP (fig. 11). This is largely in accordance with the material evidence: pottery from stratum 1 horizons recalls on typological grounds pots and pans from Ilıpınar VA (Roodenberg, 1999:23). When comparing other categories such as architecture, Ilıpınar VA buildings were constructed with mud bricks, had plaster floors, built-in as well as exterior facilities for cooking and storing food. Nothing of this kind was clearly detected in stratum 1 at Menteşe, with the exception of a trunk of mud brick walling, a piece of plaster floor and the footing of a round oven. Otherwise the investigated zone seems to have been largely used as an open area.

Stratum 2

Since no suitable charcoal samples could be collected from the scorched surfaces of stratum 2, more precise Radiocarbon determinations than the *ante* and *post quem* datings from the previous and following strata delimiting this period of time between 6800 and 7050 BP are not available. During this interval or part of it, presumably the entire mound was arable land. Judging from the section drawings, tillage activities levelled the very top of stratum 3, as is exemplified by the missing right part of the uppermost floor in the northern section. Hence, the stratum 3 period may have lasted slightly longer than is expressed by the datings.

A TECHNOLOGICAL AND TYPOLOGICAL ANALYSIS OF THE POTTERY
by A. van As, L. Jacobs, M.-H. Wijnen[1]

Material and methods

The study of the earliest Neolithic pottery of Menteşe includes the analysis of the manufacturing technique (shaping, finishing, decoration and firing technique) as applied by the potters and the analysis of the clay body used by them (fabric analysis). Next, a classification of the shapes of the pottery is presented. Finally, an impression is given of comparable pottery of Fikirtepe, Ilıpınar X and some other sites[1].

The entire ceramic assemblage that was studied includes a few more or less complete vessels and a good 1300 sherds stemming from the deep sounding, levels 126-130 (lower occupation levels), levels 110-125 (middle occupation levels), and levels 100-109 (upper occupation levels).

For the analysis of the manufacturing technique the complete vessels and – after a thorough inspection of the entire number of sherds – a representative sample of 700 diagnostic sherds (473 rim fragments (some with handles, lugs or knobs); 91 base fragments; 100 fragments of handles; 5 fragments of lids; and 18 decorated sherds; and 13 varia have been studied. To enable easy reference to the archaeological context (area, level and lot number) of each sherd, the sherds have been numbered.

For practical reasons, first a preliminary classification of the sherds was made in order to obtain an impression of the various vessel types present in the assemblage.

The pottery has its own typical characteristics. It has simple but well balanced forms. The profile of the body of the vessels is generally not carinated. Its red/brown to grey/brown surface was usually smoothed and then entirely or partly burnished. As a consequence, the structure of the vessels is strong and their permeability low. The nice highly burnished vessels could easily be cleaned. All in all the earliest earthenware vessels of Menteşe are qualitatively good products.

The shaping and decoration technique of the pottery was analysed through the explanation of the various technical features that could be observed. Since smoothing and burnishing largely erased the marks of the earlier primary forming technique, this was not an easy task. Another factor in this respect was the quality of the mineral-tempered clays that were used. Coils of these clays adhere very well. Therefore it was barely possible to notice traces of the coiling technique. Nevertheless, indications of this technique

[1] The investigations were carried out by the authors between 7 and 16 August 2002 at the excavation house of the Ilıpınar archaeological expedition at Gölyaka. Traveling expenses and subsistence were financed by the Foundation for History, Archaeology and Art History (SHW) which is part of The Netherlands Organization for Scientific Research (NWO). Refiring tests and detailed fabric analysis were executed in the Ceramic Laboratory of the Department of Pottery Technology of the Faculty of Archaeology at Leiden University. The pottery drawings were made by Bengü Kılıçbeyli; fielddrawings were adapted by Ben Claasz Coockson. We heartily thank collegue Mehmet Özdoğan who afforded us the opportunity to see the pottery of Fikirtepe stored in the building of the Faculty of Archaeology of the University in Istanbul.

could be found in the horizontal breaks following the joints of the coils. Cracks square to the joins of the coils and other details such as slight thickenings where the coils had been joined together form other indications. It goes without saying that the complete vessels and larger fragments yielded the most unambiguous information.

The colours of the sherds (inside, outside, and core) measured by using the Munsell Soil Color Charts (MSCC) (revised edition 1992) enabled us to judge the firing conditions. The firing temperature was estimated by measuring the hardness using the Mohs scale and refiring tests.

The fabric analysis included the study of the matrix, pores, and non-plastic inclusions of a sample of 50 sherds using a stereo-microscope (magnification 10-40x).

Pottery technology

All pottery analysed was handmade. The following methods could be distinguished.

Pinching

Evidence of only a few pots made by this technique have been found (e.g. fig. 12: 1). The potter using the thumb of one hand made a hole in a piece of clay held in the other hand. Subsequently the wall was formed and made thinner by pinching the clay between thumb and the other fingers. In this way, the shape gradually became wider. During the process the small pot was turned while it was supported by the palm of one hand. This shaping technique can be recognized by the traces left by the fingerprints during the pinching process. The size of these small pots is limited by the size of the potter's hands. Using a clay that includes coarse-grained inclusions, the rupture around the grains during pinching can be problematic. To prevent this the potter has to work fast with a clay in a rather soft condition. For the same reason it is also possible to use a clay without many coarse-grained inclusions.

Coiling

First the base was made in one of two different ways. A piece of clay was flattened, either between both hands for the small bases or on a surface of porous material for the large bases. As a result, a flat or slightly curved base was obtained. The more pronounced convex bases were probably made in a mould. In the external surface of such a base small cracks are visible. These are the remains of larger cracks that are the result of pressing the clay into a mould, as the clay of relatively small forms is stretched out by this action. However, by contact of the soft clay paste with the hard surface of the mould these cracks were partly or completely filled up.

After the bottom section, either flat or curved, had been shaped, the remainder of the pot was made using coils of clay. Sometimes a mark of the join is visible on the edge of the base. The joins of the coils, however, are often invisible. In general, they are only

indicated by slight thickenings of the wall and by traces of strengthening the wall at these places by tapping, scraping, smearing and smoothing .

Usually, there is a gradual transition from the base to the body of the vessels. The construction of this flowing form is strong because it prevents the development of cracks in the base whereas the joined coils do not easily come loose due to shrinkage during drying and firing. Sometimes the base-body transition is rather angular on the outside as a result of scraping, tapping or adding some clay.

In a single case a ring of clay was added beneath the base (fig. 15: 5). The join was strengthened with some extra clay.

Finishing technique

Handles

Some vessels were furnished with handles and grips (see fig. 16). The potters of Menteşe did not make the handles heavily tempered to reduce the shrinkage and to strengthen the attachment to the vessel's body as is often done in the case of the manufacture of storage jars in other archaeological periods elsewhere (Franken 1993/1994: 48). To attach the handles or lugs properly, the surface of the vessels of Menteşe was often roughened by cutting it slightly with a sharp object. After the pre-shaped handle had been attached, a small coil of clay was worked around the handle. This was then smoothed in order to produce a handle which would become part of the wall without any sharp edges indicating the joints. The handles were usually joined horizontally. They were attached before the pot was burnished.

Burnishing

After the vessels had been left to dry, most of them were carefully burnished by rubbing them with a very hard and smooth pebble. This was done in one direction, either horizontally or vertically. An even better result was obtained by doing it alternatively first in one and then in another direction. In any case it was not done arbitrarily. This certainly holds true for the external surface of the vessels since these are usually more intensively burnished than the inside. The inside was often carelessly burnished as a result of which lustreless strokes are visible between the glossy ones. This means that the main motivation for burnishing was esthetic rather than functional. It is also true that it is easier to burnish a round external surface more thoroughly than a concave surface on the inside.

The intensity of the polish varies from satin gloss to high gloss. There seems to be no direct relationship between the surface colour of the vessels and the intensity of the gloss. Although dark grey and black surfaces are very glossy all other colours are also shiny. The development of the gloss was dependent on various factors, such as the phase of burnishing, the fineness of the clay, and the absence of salts soluble in water.

The extent to which the vessel was dried determined the gloss of the object: the harder the clay the glossier the surface. As a rule, a rather dry clay gives the best results. However, if the clay is too dry or too hard scratches are formed.

A well burnished surface exists of flat orientated clay particles. During firing above ca. 950° C this structure changes as a consequence of which the gloss disappears. Coarse or protruding inclusions in the clay can disturb the gloss. This can be prevented by smoothing or 'pre-burnishing' the surface in a rather soft condition in advance. In this way the inclusions are pushed into the clay and covered with clay particles. The inside of the vessels was often only smoothed.

If there are non-plastic inclusions just beneath the burnished surface, little hair cracks are easily formed in the exterior surface during shrinkage as a result of drying and firing. In order to keep the gloss of burnish after drying and firing clay or water that contains too much salt should not be used. Finally, it should be noted that the post-depositional conditions can have an influence on decrease of the gloss. On the other hand, the gloss can increase by wiping the surface of the vessel after the burnishing procedure with a soft dry knot of wool or similar material.

Decoration technique

Three types of decoration were distinguished: (1) incision; (2) appliqué; and (3) slip decoration (see fig. 17).

The first type of decoration includes a criss-cross pattern of lines that were incised after the burnishing procedure. Since the clay is already very dry and hard in this stage, the incised lines showed serrated edges. Especially, when the clay contained a lot of inclusions. The incised lines are not very deep. Sometimes they are filled in with a loam of a contrasting light colour. The deeper incised lines must have been made before the burnishing procedure when the clay was still soft.

In the case of appliqué decoration, small rolls or strips of clay were applied to the surface of the pottery.

An example of a slip decoration is found on a yellow-red fired rectangular bowl. Since the red and white firing zigzag slip lines are rather thick, they tend to crumble off.

Firing technique

After 50 sherds (see fabric analysis) were refired in an electric kiln under oxidizing conditions at 750° C for half an hour, the sherds turned from weak red (2.5YR6/4) and red (2.5YR6/6/- 10R5/6) to yellowish red (5YR5/6) and strong brown (7.5YR5/6). This means that the clay that was used contained components of iron. The surface of the vessels is often in mottled colours. Almost every hue between black, grey, brown and red is found. This indicates the use of open bonfires in which the pottery was in direct contact with fire and fuel. Such a firing technique produced an alternating oxidizing, neutral or reducing atmosphere if no further action was undertaken. Sometimes the differences

within the bonfire were so big that a diversity of colours became visible in one and the same vessel. Wherever the surface is monochrome (black, brown or red), the potters obviously succeeded in keeping better control of the firing process.

In general a distinction can be made between rather dark and lighter hues. The interpretation of the colours of the surfaces and cores of the sherds resulted in a number of firing conditions (see appendix 1).

1. Fired under controlled heavy or less heavy reducing conditions. The vessels were completely enclosed by fuel, probably covered with sherds and smothered. As a result of the penetration of some oxygen during smouldering at the end of the firing process the atmosphere became neutral.
2. Initially fired in a reducing atmosphere and at the end of the firing process a short period of neutral/oxidizing atmosphere.
3. Fired under neutral conditions.
4. Fired under neutral conditions with a short oxidizing phase at the end.
5. Fired in a completely oxidizing atmosphere or almost oxidizing atmosphere.
6. Mainly fired under oxidizing conditions. At the end of the firing process the atmosphere was reduced by closing off the inflow of oxygen.
7. Mottled colours on the surface indicate an open fire under mainly neutral, neutral/oxidizing, or neutral/reducing conditions. Some vessels fired under mainly neutral oxidizing conditions with a dark reduced surface on the inside indicate that the vessels were put upside-down over the fuel in the bonfire. This method of piling results in a better and more even heating of the base parts. Consequently fewer vessels are spoiled by thermal shock during the process of firing and cooling down.

Hardness is an aspect of pottery which points to the original firing temperature. Mohs'hardness number 3 is prevalent. The original firing temperature could be estimated at approximately 700 - 850° C by measuring the hardness and shrinkage behaviour of the sherds after refiring in increments of increasing temperature.

The manufacturing technique of some complete vessels

Coiled restricted bowl with a flat base (fig. 12: 2). Since the building up of the wall in the coiling technique is easier as soon as the diameter is wider, the wall below is rather thick compared to the higher part. The wall below is also more irregular as a result of scraping the outside in a leather-hard condition in order to make the wall thinner. The upper part of the wall could be made thinner by pinching during forming. The surface on the outside was completely burnished. The inside was burnished until four centimetres below the rim. This means that it was not done for reasons of making the bowl less porous or impermeable for liquids. The direction of burnishing was mainly horizontal. The bowl was fired in a reducing atmosphere with a neutral end phase. For the colour description of this and next vessels see appendix 1.

Coiled restricted bowl (fig. 12: 3). The surface on the outside has been burnished completely, the inside till ca. one centimetre below the rim. The inner surface was smoothed. The bowl was fired in a reducing/neutral atmosphere.

Coiled unrestricted bowl with rather thick irregular wall (fig. 12: 4). The bowl has been burnished completely on the outside. The surface was roughened before attaching the handles. The bowl was fired in a lightly oxidizing atmosphere.

Box (fig. 12: 5] made in the coiling and pinching technique. The decoration was made by engraving and cutting the clay. The surface has been burnished in a mainly horizontal direction. The coulours indicate that the bowl was left in the ash layer after firing. Consequently no oxygen could reach the bowl's surface.

Fabric analysis

A sample of 50 sherds was taken for fabric analysis using a stero-microscope (10 - 40x magnification).

In all cases the matrix is normal. Only one sherd has a very high amount of fine calcite grains, which caused a crumbly structure after re-firing at 750°C under oxidizing conditions.

The highest total amount of grains is ca. 30 %. Though rather high, such quantities of grains still give an acceptable result. Since organic fibrous temper was not added to the clay, the structure of all fabrics is normal. The sorting of the grains varies from good, moderate to bad. Good sorting means that all grains are of about the same type, size and shape. The mixture of clay and grains is homogeneous. Bad sorting means the opposite. Moderate sorting is a situation in which the grains do not differ very much. The shape of the grains varies from angular to rounded (A = angular; SA = sub-angular; SR = sub-rounded; R = rounded). The average upper grain-size limit was around 1.5 to 2 mm. Rather often, however, a small amount of coarser grains occurs. This points to a certain, probably partly natural selection of grain size, not by sieving. Sometimes grains with a diameter up to almost one cm do occur. It seems that such grains escaped from the control of the potter.

Considering the dominant grain types, four main fabric groups can be distinguished: (1) calcite (ca. half of the sample); (2) quartz (ca. one fourth of the sample); (3) calcite and quartz (ca. one sixth of the sample); (4) iron schists and micaceous schists (ca. one tenth of the sample). Groups 1-3 could be subdivided based on criteria, such as sorting grain size and quantity.

Calcite is a soft mineral, easy to cleave and vulnerable to erosion. Since sharp non-eroded calcite grains are present in large quantities they are probably added to the clay. It must have been a preferable temper material. Lumps of calcite can easily be crumbled by pounding them. Calcite tends to break in fine angular grains, which can be mixed through the clay. The calcite grains in the non-refired sherds proved to be completely intact and the calcite was still in its crystalline shape. Because such grains tend to decompose when heated

above 750° C, it was concluded that the ceramics were baked at rather low temperatures. This is confirmed by the original firing colours and the relative softness of the fabrics.

Quartz grains may have been an alternative to calcite, though quartz is much harder and therefore more difficult to break in small grains. Quartz grains may have been available in the form of sand deposits and in small quantities they are often already present in a lot of clays. Such is also the case with frequently occurring grain types like mica's, rock-fragments and compounds of iron or calcium. The grains are often angular and sub angular in shape. This points to a situation where clays are found not far from mountains and rock formations.

In some local deposits micaceous schists, micas and iron compounds occur in large quantities. Schists are rather soft and easy to cleave. Because of this characteristic and their behaviour under heat-shock, they have good properties as a tempering material. However, because the pottery of Menteşe was rather low fired, almost any other tempering material could be used.

From a technological point of view and in terms of pottery production, the differences in clay composition may have had some implications. Since no fibrous organic material was added to the clay, a certain amount of grains was necessary to improve the adhesive capacity and to avoid cracks during drying and firing.

Classification of shapes

The sample contained a few complete/partly complete vessels (four in total). However, four possible basic shapes could be distinguished among the sherds analysed:

1. (Restricted) pots
   The inward angle of inclination of the vessel wall is more than ten degrees. The mouth diameter is less than the belly diameter. In general the ratio between mouth diameter and height of the pot is estimated in a minimal proportion of two to three.
2. Restricted bowls
   The inward angle of inclination of the wall is between zero and ten degrees. In general two types can be distinguished:
   a. deep bowl: ratio between mouth diameter and height of the bowl is approximately one to one;
   b. shallow bowl: ratio between mouth diameter and height is between three to two and two to one.
3. Unrestricted bowls
   The outward angle of inclination of the vessel wall ranges from zero to twenty degrees. In general two types can be distinguished:
   a. deep bowl: ratio between mouth diameter and height of the bowl is approximately one to one;
   b. shallow bowl: ratio between mouth diameter and height of the bowl is between two to three.

4. Boxes
   Rectangular shaped with vertical walls. Ratio between short side and long side estimated to be three to four. The boxes have four feet and may be provided on one of the sides with a rather large handle.

The various shapes will now be discussed in more detail. It has to be noted, however, that partly due to the size of the fragments, a fair amount of the sherds could not be ascribed with certainty to one of the vessel shapes. In total the sample consisted of 28 rim fragments (plus one partly complete vessel) of the unrestricted or open type and of and of 390 fragments (= two almost complete vessels of restricted or closed shape. Of the restricted rims only 52 could be ascribed to a shape.

Pots

There are no complete or even partly complete vessels of this type among the sample. Within this category three types could be distinguished.

The first type has a straight rim. The thickness of the vessel wall changes very little or increases slightly towards the lip. The lip is rounded or flattened (hole mouth, fig. 13: 1; 2; 3). In total 23 fragments could be allotted with certainty to this shape, of which 14 from levels 120-130. Most fragments had a wall thickness of ca 10 mm or slightly more, which is rather heavy in comparison to the common wall-thickness of the rim fragments in the sample (between 4 and 7 mm). Mouth diameters were not always easy to measure, but seem to vary between 17 and 30 cm. If this is correct it would mean that these hole mouth jars were fairly large sized.

In the second type the vessel wall changes very little towards the lip, but the lip is tapered interior, and may have a slight tendency to curve outward (fig. 13: 4; 5). One of the larger fragments in this category had the remains of a vertical pierced lug some four cm below the lip (fig. 13: 6). One fragment had a vertically pierced lug directly inside the rim (fig. 13: 7).

In the third type the rim was bent outwards at approximately two centimetres below the lip, thus creating a pseudo-collar. In the sample were three larger fragments of this type (fig. 13: 8). Real collars, which are stuck to the wall at a sharp angle, were not found in the sample analysed.

Restricted bowls

For fragments with a mouth diameter > 15 cm, which had broken of above the widest diameter of the belly, it is not possible to discern deep bowls from squat bowls. However, from the amount of fragments which are broken below the widest belly diameter, we get the strong impression that the squat bowl was more common. Two of the complete vessels belong to this type (fig. 12: 2; 3). Both are flat based. The vessel wall is thinning towards the rim, the rim turns slightly outwards and the lip is blunt. For most fragments, which can be described as either deep or squat bowl, this seems to be the basic shape (fig. 9: 9; 10; 11).

Mouth diameters range between 8 and ca 25 cm. Several fragments, which could be ascribed to the squat type, were oval shaped.

The complete bowls did not have handles. However, among the fragments which can be ascribed to squat bowls were three fragments with a vertically pierced lug right, placed right above the largest belly diameter (fig. 13: 12 and fig. 14: 1). Of these fragment fig. 14: 1 is strongly oval shaped: however, the knob is placed just beside the apex. This could possibly be compared to an oval bowl with four symmetrically opposed vertically pierced knobs from Fikirtepe; this bowl has at one apex remains of a kind of "panhandle" (Özdoğan 1999: fig. 33). Another oval rim fragment had a horizontally pierced knob (fig. 14: 2), again placed right above the largest belly diameter. Some of the rims have a 'mending hole' just below the lip (fig. 14: 3; 4). From the levels 126 not one fragment of the restricted rims could with certainty be ascribed to the squat bowl type.

Unrestricted bowls

One of the partly complete vessels belongs to this type (fig. 12: 4). It is slightly oval shaped and has a fairly irregular wall, which tends to thicken towards the rim. The lip is blunt. It has a plano-convex base (the change form base towards wall is rounded, rather than angular). It has the scar of a lug attachment some 6 cm below the lip.

Again, for the smaller fragments with a mouth diameter >15 cm, it is not possible to ascribe them to either deep or shallow type. However, the curvature of some of the sherds (fig. 14: 5; 6; 7) seems to indicate the mouth-diameter/height ratio of the shallow shape. Wall-thickness lies in general between 4 and 7 mm; mouth diameter varies between 6 and 22 cm. This probably is also true for the one fragment (fig. 14: 8 – with missing lip), which has a vertically pierced lug just below the rim.

Boxes

One of the partly complete vessels belonged to a rectangular box (fig. 12: 5). Long side 15 cm, short side ca 11 cm. On the bottom the scars of two of the leg are visible. At the corner of the long side the scar of a possible handle can be noticed in the middle of the wall, near the corner towards the left small side of the box. Judging by the position of the scar this should have been a horizontal placed handle (opening vertical). Both short sides are decorated in a pattern of vertical bands with with excised triangles.

Among the sample are seven more fragments of boxes. Six of them are decorated with incised line patterns, at least four of them consisting series of cross-hatched triangles (fig. 15: 1: 2; 3; 4). One of the boxes had a painted decoration zig-zag lines in white and red (the flaky white slightly thicker than the red).

Not among our sample (it being at the Iznik museum), but also discovered during the Menteşe 2000 excavations is a complete square box with four feet, a horizontal handle and again incised decorations in a cross-hatched triangle pattern on the sides (fig. 5a).

Base shapes

The sample contained a fair amount of bases. With the exception of one ring base fragment (fig. 15: 5) these were all flat. Among these two types could be distinguished:

1. a flat base with rather sharp angles towards the wall of the pot (e.g. fig. 12: 2; 3 and fig. 15:6; 7; 8; 9). The sample contained 32 fragments of this type.
2. a plano-convex base with curved angles towards the wall of the pot (e.g. fig. 15: 10; 11; 12; 13). Several of the bases of the first type were more or less oval in shape. The sample contained 56 fragments of this type.

Handles

The sample contained about hundred handle fragments (including scars or broken fragments). In general one can distinguish three types:

1. Pierced knobs.
   These included rather small knobs (fig. 16: 1; 2) and more boldly shaped larger knobs, which are occasionally slightly angular (fig3488), elongated (fig. 16: 3; 4) – resembling tubular lugs - or slanted (fig. 16: 5; 6). Although in general they seem to be vertically pierced, but as we have seen earlier, there is at least one example which was pierced horizontally. In general they are placed slightly above or on the belly diameters of restricted shapes. As stated by L. Thissen (Roodenberg and Thissen, 2001: 13) strings were connected through the (vertically) pierced lugs, to enable suspension, transport and – possibly tight covering by lids (pottery, cloth, wood or hide). He remarks that pots in general have four knobs, placed symmetrically opposing. In fact, among the five complete(d) vessels from the Menteşe 2000 excavations, which are at present in the Iznik museum is one pot with four symmetrically opposed vertically pierced knobs, placed slightly above the belly diameter as well as a miniature bowl/cup with four vertically pierced knobs, placed on the belly diameter. The sample contained around 36 fragments of this type (broken fragments and pierced knobs on rim fragments not included).
2. Lugs.
   Either (vertically) pierced (fig. 16: 7) or not pierced (fig. 16: 8; 9). They were placed horizontally, probably, as was the case with the pierced lugs, slightly above or on the belly diameter of the vessel. Thissen (as above, p 16) states for Ilıpınar that lug handles occur solely on pots (they have two opposing lugs). Our sample contained in total 15 lugs.
3. Large handles
   The sample contained one fragment (fig. 16: 10). A large flattened strap handle, (length ca. 6,5 cm) placed vertically (with the opening horizontally), probably on a box or large cup (cf. Özdoğan 1999: fig. 5 and fig. 30).

Decorated fragments

The sample contained in total 16 fragments with incised decoration. Of these 14 fragments with shallow incised cross-hatched patterns, included the seven fragments of decorated boxes described above. This decoration type was, however, not exclusively used on boxes (fig. 17: 1; 2). It may have occurred also in other 'patterns' than the triangle patterns

found on the boxes. In some cases the incised lines showed traces of having been filled in with a lighter clay-slip. Two fragments have a more deeply incised linear decoration (fig. 17: 3; 4). Two fragments are decorated with a pattern of excised vertical parallel grooves (fig. 17: 5).

There was one fragment of appliqué decoration (fig. 17: 6) – a rather shallow, large crescent. As described under the heading boxes, the sample included one fragment, actually two pieces, of painted decoration a pattern of parallel running zigzag lines, executed in a combination of red and white on a buff surface (fig. 17: 7). The white is slightly thicker and flaky.

Varia

The sample included one fragment of a sieve (fig. 17: 8), four fragment of flat, disc-shaped lids with holes (to attach the string through) (fig. 17: 9; 10; 11), two fragments of raised lids, one spoon-like object, which actually may also be a handle of some sort (fig. 17: 12), one ceramic ring (fig. 17: 13) and one fragment of a spoon handle (with part of the spoon) (fig. 17: 14). This last fragment could also be the handle of a spouted cup. This observation is based on the fact that among the complete vessels from the Menteşe 2000 excavation, which are in the Iznik museum, is a spouted cup/sauceboat with a similar kind of handle.

Stratigraphic distribution

One of the goals of our research was to see how the pottery of basal Mentese, excavated in 2000, could be placed in the general (Neolithic) sequence of Northwest Anatolia. The radiocarbon dates indicate that the lowest levels (126-130) predate Ilıpınar X by some 400 years. To make the general comparison, we should first see if within the Menteşe sample a 'development' could be noticed. In the sample we studied the pottery from levels 126-130 (the oldest occupation levels found at Menteşe), levels 120-125 (middle-lower occupation levels), levels 110-119 (middle-upper occupation levels) and levels 100-109 (upper occupation levels) showed no marked distinction in development of manufacturing techniques and shapes. However, some slight differences in the shapes could be noticed. Although the total number of rim fragments from the levels 120-130 is certainly far smaller than that from 100-119, the number of rim fragments which could be ascribed to plain, rather heavy walled hole mouth shapes is certainly larger (14 opposed to nine). Fragments of boxes do not occur in levels 120-130. I have the slight impression that highly burnished, really black fragments were very rare in levels 120-130. Incised decoration was also found less in the lowest levels – but here we should not forget that there is a number bias. Lugs and pierced knobs are very rare in the levels 129-130 and common in levels 100-119.

Comparison with other sites

During our work in 2002 we also visited the University of Istanbul, to have a look at

the pottery from Fikirtepe, excavated by Bittel in 1956 (Bittel, 1969), which has been studied in extenso by Mehmet Özdoğan. On the whole we noticed that the shape repertories of Menteşe and Fikirtepe showed a strong resemblance. Özdoğan states that in Firkitepe the presence of a "lower" and an "upper" horizon is evident, representing the archaic and classical phases of the culture (Özdoğan, 1999: 213). As is the case in Menteşe there is no clear break between the two phases and the change in the pottery is general. According to Özdoğan the predominant shapes in the Archaic phase are hole-mouth vessels with simple profiles. Due to the large amount of restricted rim fragments which could not be ascribed to a certain shape (23 in levels 126-130 and 49 in levels 120-125) it is not possible to state that the same was true for Menteşe, but it certainly can not be excluded. In the archaic phase at Fikirtepe rectangular vessels (boxes) occur, but are rare and not well developed. At Menteşe boxes did not occur at all in the lower levels (120-130). Decoration is sparse in the Archaic phase at Fikirtepe and when it occurs it is always of the shallow incised type. In the Classical Fikirtepe phase hole-mouth vessels diminish in number, being gradually replaced by typical "S"-profile bowls and jars. Although we are once again hampered by the large amount of restricted rim fragments which could not be ascribed to a certain shape, this may hold true, too for Menteşe (cf both complete bowls, as well as another bowl from Menteşe 2000, at present in the Iznik museum – certainly no classical "S"-profiles, but one can see clearly how the "S"-shaped profile would eventually develop out of this shape). Incised decoration and rectangular vessels (boxes) are relatively more common during the Classical phase at Fikirtepe. As we noticed before, this holds certainly true for the higher levels at Menteşe. Özdoğan noticed in the Classical phase also the introduction of a new ware type, represented by well burnished sherds with an almost jet black surface. I am not entirely sure whether this ware type is similar to the highly burnished, really black rim fragments, which occur in the higher levels of Menteşe.

On the whole the repertory of Menteşe can be compared favourably to the Archaic and Classical phases of Firkirtepe, as illustrated in Özdoğan, 1999 (figs. 5, 28,30,31, 32,33 and 34).

As stated by Özdoğan and noticed also in our earlier studies of the Ilıpınar material, typical Fikirtepe pottery occurs at Ilıpınar X and IX. Although we realise that the C-14 dates indicate that the upper levels of Menteşe are slightly older than (or at the most contemporaneous with) Ilıpınar X, we still made a comparison with Ilıpınar X, as analysed by L. Thissen (Thissen, 2001: 9 ff.). He states that the basic shape of Ilıpınar pots from Phase X is a squat, rather than globular hole-mouth with a flat base and two mutually exclusive sets of handles. The large amount of restricted rim fragments in the Menteşe sample which could not be ascribed with certainty to a shape makes it not possible to say whether this holds true for Menteşe, too. We have the strong impression that indeed squat forms rather than globular were the basic shape in Menteşe, but it seems that there were a fair amount of vessels which did not possess handles. It should however be noted that there exist differences in terminology, especially where shape description is concerned, e.g. Thissen classifies the (oval) bowl as an open form. However, he states (Thissen, 2001: 18) that he assumes that "most likely, many open forms possess restricted or slightly restricted hole-mouth shaped rims, as is clear

from the Phase X pottery from the Section Trench. On the basis of the Section Trench pottery, such 'hole-mouth bowls' are always oval shaped, have usually a small 'bead-rim' and never possess handles of any kind. In shape they are not clearly differentiated from hole-mouth pots, which are, however, never oval mouthed, and always possess handles." The open forms he discerned in his analysis are those that are clearly different from hole-mouth pots. Still, some of those would have been classified in our description as restricted bowls (as are indeed our two complete bowls). The general shape repertory of Ilıpınar X as seen in the illustrations (Thissen, 2001: figs. 6, 7,9, 10 and 11) resembles the shape repertory of (the upper levels of) Menteşe. The Ilıpınar X pottery differs, however, from the Menteşe pottery by the fact that chaff-temper was present from the outset in the earliest pottery at Ilıpınar (i.e. phase X). At Menteşe no organic material had been added to the paste, not even in the lowest levels.

Regarding decoration we notice in the Ilıpınar X sample the shallow incised cross-hatches patterns (Thissen, 2001: fig. 8:9). The decoration on the leg fragment of a box (fig. 14) is slightly different from the decorations as found at Menteşe, since it combines incised and punctured decoration. The Ilıpınar X sample also includes the excised line decoration, which occurred at Menteşe. The box fragment with painted decoration remains a riddle. The Ilıpınar X sample contained one vessel with painted decoration, executed in red linear bands on a crackly white slip; according to Thissen this certainly was an import. The Menteşe fragment seems, as far as regards paste, not different from the other pottery found at Menteşe. The box shape belongs to the repertory, but for the decoration we are hard put to find equivalents. At Hoca Çeşme (II) as well as at Aşağı Pınar linear painted decoration occurs, executed in rather flaky white slip; motifs include the wavy bands. However, the dating for these phases is later than that of Menteşe. There seems to be no strong resemblance to the painted decoration from Central Anatolia, which seems in general better executed. Here it should be noted that we have to go largely by colour illustrations, or the better fragments, which we have seen at Istanbul University.

Conclusion

The first inference to be drawn from the above is that basal Menteşe was the oldest village in Northwest Anatolia according to radiocarbon datings. The second, that not only its chronology closely precedes Ilıpınar's 600-years-long sequence, but also provides, in combination with the latter, a thousand-years-long framework for the benefit of site-to-site artifact comparison. Radiocarbon dating is in our opinion a far better method for the distinction of chronological relations than the uneradicable habit of comparing 'goodies' from different settlements. On the other hand, when absolute datings are lacking, as in the case with the Fikirtepe group of sites, technological and typechronological study of the material culture is the only alternative. Since handmade pottery of Fikirtepe has not been studied technologically, no conclusions can be drawn in this respect. The pottery of Ilıpınar X evinces the same forming, finishing and firing techniques as those used by the potters of Menteşe (van As and

Wijnen 1995). As in Menteşe, a high percentage of the pottery of Ilıpınar X was burnished. Only one remakable technological difference could be detected. Unlike in Ilıpınar X the potters of Menteşe did not add organic material to the clay body as temper. Regarding the shapes, we can state that the pottery repertories from Menteşe and Fikirtepe show strong parallels and that at Menteşe we probably see a development from the Archaic phase of Fikirtepe into the Classical phase. Ilıpınar shows parallels with the Classical phase as well.

The afore induces to the construction of a tentative chronological chart linking basal Menteşe to Ilıpınar and Fikirtepe, where the relative data seem to fill the absolute framework as follows:

basal Menteşe	Ilıpınar	Fikirtepe	cal. BC.[2]
—	phase X	classical	6000
upper		classical	6200
middle		archaic	—
lower		archaic	6400

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Appendix 1

In the colour description (MSCC) the surface on the inside/outside and core is respectively indicated as I, O and C.

1. Reducing.
[706]
I, O and C 10YR2/1 (black)

[445; 617]
I 10YR3/2 (very dark greyish brown) - 10YR3/1 (very dark grey);
O 10YR3/2 (very dark greyish brown) - 10YR3/1 (very dark grey);
C 10YR4/2 (dark greyish brown).

2. Initially reducing, at the end neutral/oxidizing.
[673]
I 10YR6/4 (light yellowish brown)
O 10YR5/6 (yellowish brown)
C 10YR3/1 (very dark grey)

3. Neutral
[409; 541]
I 2.5Y6/3 (light yellowish brown);
O 2.5Y6/2 (light brownish grey) - 2.5Y6/1 (grey);
C 2.5Y5/1 (grey).

4. Neutral, at the end a short oxidizing phase.
[644]
I 2.5YR6/3 (light yellowish brown);
O 10YR5/6 (yellowish brown);
C 10YR4/4 (dark yellowish brown).

5. Oxidizing.
[12; 183]
I 2.5YR5/6 (red);
O 2.5YR5/6 (red);
C 5YR6/4 (light reddish brown).

6. Mainly oxidizing, at the end reducing.
[387]
I 10YR4/1 (dark grey) - 5YR5/4 (reddish brown);
O 10YR4/1 (dark grey) - 5YR5/4 (reddish brown)-
5YR6/6 (reddish yellow);
C 5YR6/6 (reddish yellow).

7a. Mainly neutral.
[348; 389]
I 10YR3/1 (very dark grey) - 10YR6/3 (pale brown);
O 10YR5/4 (yellowish brown);
C 10YR5/1 (grey) and 10YR5/3 (brown).

7b. Neutral/oxidizing.
[391]
I 5YR5/4 (reddish brown) - 10YR3/1 (very dark grey);
O 5YR5/4 (reddish brown) - 10YR3/1 (very dark grey);
C 5YR6/6 (reddish yellow).

7c. Neutral/reducing.
[209]
I 5YR5/4 (reddish brown)/ 5YR4/2 (dark reddish grey);
O 5YR5/4 (reddish brown)/ 5YR4/2 (dark reddish grey);
C 7.5YR4/2 (brown)/ 7.5YR4/1 (dark grey).

Colour description of some complete vessels:

[707] I 7.5YR5/1 (light brown) - 7.5YR5/2 (grey) and 7.5YR5/4 (brown);
O 10YR6/4 (light yellowish brown) - 7.5YR6/6 (reddish yellow) and 7.5YR6/6 (light brown);
C 10YR5/1 (grey) - 10YR4/1 (dark grey).
[708] I 7.5YR6/6 to 7/6 (reddish yellow);
O 5YR6/6 (reddish yellow) - 7.5YR7/6 (reddish yellow);
C 7.5YR7/6 (reddish yellow) - 7.5YR7/1 (light grey).
[709] I 10YR3/1 (very dark grey) - 10YR5/4 (yellowish brown);
O 1 0YR3/1 (very dark grey) - 10YR3/2 (very dark greyish brown) - 10YR5/4 (yellowish brown);
C 5YR5/3 (reddish brown) - 5YR3/1 (very dark grey).
[710] I 10YR6/2 (light brownish grey) - 5YR6/3 (light yellowish brown) - 10YR2/1 (black);
O 10YR6/3 (pale brown) - 10YR5/2 (greyish brown) - 10YR2/1 (black);
C 10YR5/2 (greyish brown) - 10YR6/3 (pale brown).

Appendix 2

Calcite

[9]Dominant grain types: calcite (black grains = carbonaceous calcite); feldspar (sporadically: hematite; siltstone)
Sorting: moderate
Shapes: A
Amount of grains: ± 30 %
Dominant grain size: 50 μ ≤ α ≤ 1000 μ

[322] Dominant grain types: calcite
Sorting: moderate
Shapes: A - SA
Amount of grains: 35 %
Dominant grain size: 50 μ ≤ α ≤ 500 μ

[361] Dominant grain types: calcite
Relatively few: iron oxide siltstone; siltstone
(sporadically: quartz; iron oxide siltstone)
Sorting: moderate.
Shapes : A - SA; some R.
Amount of grains: ± 35 %
Dominant grain size: 50 μ ≤ α ≤ 1000 μ

**

[34] Dominant grain types: calcite
(sporadically: basalt; quartz; siltstone; hematite)
Sorting: moderate.
Shapes: A - SA.
Amount of grains: 25 to 30 %
Dominant grain size: 50 μ ≤ α ≤ 1500 μ

[51] Dominant grain types: calcite
undissolved clay grains; siltstone; iron oxide- siltstone
Relatively few: quartz
(sporadically: basalt; iron schists)
Sorting: moderate.
Shapes: A - SA and R - SR.
Amount of grains: ± 15 %
Dominant grain size: 50 μ ≤ α ≤ 1000 μ (incidentally up to 2 mm.)

[196] Dominant grain types: calcite
Relatively few: micaceous schists
Sorting: moderate
Shapes: A - SA, some SR
Amount of grains: 35 %

stone
(sporadically: quartz)
Sorting: moderate to good
Shapes: A (calcite cleavage)
Amount of grains: ± 25 %
Dominant grain size: 50μ ≤ α ≤ 1000 μ

[528] Dominant grain types: calcite;
Relatively few: iron oxide concretions
(sporadically: quartz)
Sorting: moderate to bad
Shapes: A - SA.Amount of grains: ± 25 %
Dominant grain size: 50 μ ≤ α ≤ 1000 μ

[552] Dominant grain types: calcite
Relatively few: quartz
(sporadically: hematite; iron oxide siltstone nodules; siltstone)
Sorting: moderate
Shapes: A - SR
Amount of grains: ± 25 %
Dominant grain size: 50 μ ≤ α ≤ 2000 μ

[589] Dominant grain types: calcite; siltstone; undissolved clay grains
Relatively few: hematite; quartz; limestone; rock fragments
(sporadically: iron oxide concretions)
Sorting: moderate
Shapes: SA - SR
Amount of grains: 15 - 20 %
Dominant grain size: 50μ ≤ α ≤ 1500 μ

Relatively few: siltstone; quartzite; quartz
(sporadically: iron oxide concretions)
Sorting: moderate
Shapes: A - SA and R.
Amount of grains: 25 - 30 %
Dominant grain size: 50 μ ≤ α ≤ 1500 μ

[625] Dominant grain types: calcite; limestone
(sporadically: quartz)
Sorting: moderate.
Shapes: A - SA.
Amount of grains: 25 - 30 %
Dominant grain size: 50 μ ≤ α ≤ 1500 μ

**

[610] Dominant grain types: calcite;
siltstone nodules; iron oxide-siltstone nodules
Relatively few: rock fragments withquartz; siltstone; haematite
(sporadically: basalt)
Sorting: moderate
Shapes: A - SA, some R
Amount of grains: ± 25 %
Dominant grain size: 50 μ ≤ α ≤ 2000μ

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Dominant grain size: 50 μ ≤ α ≤ 1500 μ

[393] Dominant grain types: calcite
Relatively few: undissolved clay lumps (mudrock)
(sporadically: limestone; iron oxide siltstone nodules; siltstone)
Sorting: moderate
Shapes: A and R - SR.
Amount of grains: 25 - 30 %
Dominant grain size: 50 μ ≤ α ≤ 1500 μ

[38] Dominant grain types: calcite
(sporadically: iron oxide siltstone concretions; quartz; limestone)
Matrix / pores: crumbly!
Sorting: moderate to good.
Shapes: A - SA
Amount of grains: ± 35 %
Dominant grainsize: 50 μ ≤ α ≤ 1000 μ

**

[223] Dominant grain types: calcite; basalt; limestone
Sorting: moderate - bad
Shapes: A - SA and SR.
Amount of grains: 35 %
Dominant grain size: 50 μ ≤ α ≤ 1000 μ

Quartz

[25] Dominant grain types: quartz
(sporadically: iron oxide concretions; iron oxide siltstone; basalt)
Sorting: good.
Shapes: SA - SR.
Amount of grains: ± 15 %
Dominant grain size: 50 μ ≤ α ≤ 500 μ

[174] Dominant grain types: quartz; siltstone; iron oxide siltstone; rock fragments
Relatively few: iron ox. concretions
(sporadically: basalt)
Sorting: moderate - good
Shapes: A - SA
Amount of grains: ± 15 %
Dominant grain size: 50μ ≤ α ≤ 500 μ

[351] Dominant grain types: quartz;
sandstone; siltstone iron oxide concretions; iron oxide siltstone.
Relatively few: calcite, some black; quartzite; iron schists
Sorting: moderate.
Shapes: SA - SR and A.
Amount of grains: ± 25 %
Dominant grain size: 50 μ ≤ α ≤ 3000 μ (incidentally up to 7 mm.)

[95] Dominant grain types: quartz
(sporadically : iron oxide concretions; feldspar ; siltstone
Sorting: moderate
Shapes: A - SA
Amount of grains: ± 25%
Dominant grain size: 50μ ≤ α ≤ 2000 μ

[700] Dominant grain types: quartz (various types; siltstone (various types; hematite; iron oxide concretions
(sporadically:feldspar; basalt; sandstone)
Sorting: moderate
Shapes: A - SA; some SR
Amount of grains: ± 15 %
Dominant grain size: 50μ ≤ α ≤ 1000 μ

[387] Dominant grain types: quartz (several types)
(sporadically: greyish siltstone; rock fragments)
Sorting: moderate.
Shapes: A - SA.
Amount of grains: 20 - 25 %
Dominant grain size: 50 μ ≤ α ≤ 2000 μ (incidentally up to 4 mm.)

[4] Dominant grain types: quartz
(several types); basalt
Relatively few: siltstone and iron oxide concretions; micaceous schists
Sorting: moderate - bad
Shapes: A - SA.
Amount of grains: ± 25 %
Dominant grain size: 50 μ ≤ α ≤ 2000 μ

[105]Dominant grain types: quartz
Relatively few: basalt; iron ox. siltstone; mica; iron schists; calcium carbonate
(sporadically: hematite; basalt; siltstone)
Sorting: moderate
Shapes: A - SA and SR
Amount of grains: ± 30 %
Dominant grain size: 50μ ≤ α ≤ 1000 μ

Quartz and calcite

[102] Dominant grain types: quartz; mica (muscovite); schists; calcite
Relatively few: hematite; basalt
Sorting: moderate to good
Shapes: A - SA
Amount of grains: ± 30 %
Dominant grain size: 50 μ ≤ α

[100] Dominant grain types: calcite; quartz; mica; micaceous iron schists
Relatively few: iron oxide nodules; iron oxide siltstone; siltstone; basalt
Sorting: moderate
Shapes: A - SA and R

[456] Dominant grain types: quartz (milky); calcite; iron oxide siltstone
Relatively few: rock fragments; siltstone. (Sporadically: hematite)
Sorting: moderate
Shapes: A - SA

≤ 1000 μ (incidentally up to 3 mm.)

[234] Dominant grain types: calcite; quartz
(sporadically: iron oxide concretions; siltstone)
Sorting: moderate - good
Shapes: SA - SR, some A
Amount of grains: ± 30 %
Dominant grain size: 50 μ ≤ α ≤ 1000 μ

Amount of grains: ± 25 %
Dominant grain size: 50 μ ≤ α ≤ 1500 μ

[484] Dominant grain types: calcite; iron oxide siltstone; quartz; iron manganese nodules; hematite
Sorting: moderate
Shapes: A - SA and R
Amount of grains: ± 25 %
Dominant grain size: 50 μ ≤ α ≤ 2000 μ

Amount of grains: ± 25 %
Dominant grain size: 50μ ≤ α ≤ 2000 μ

[644] Dominant grain types: calcite (some blackish); quartz (several types); siltstone
Sorting: moderate
Shapes: A - SA
Amount of grains: ± 25 %
Dominant grain size: 50 μ ≤ α ≤ 1500 μ (incidentally 4 mm.)

**

Schists

[129] Dominant grain types: micaceous
schists; mica's (blue greenish muscovite
and biotite types)
Relatively few: quartz; siltstone;
iron oxide siltstone
(sporadically: calcite)
Sorting: moderate
Shapes: SA - SR and shivers
Amount of grains: 25 to 30 %
Dominant grain size: 50 μ ≤ α ≤ 1500 μ

[162] Dominant grain types: iron schists
(very dark brown; most of them
micaceous and very fine dense structured)
(sporadically: calcite; quartz)
Sorting: moderate
Shapes: A - SA.
Amount of grains: ± 30 %
Dominant grain size: 50 μ ≤ α ≤ 1500 μ

[189] Dominant grain types: micaceous iron schists (contains also basalt and calcite in combination with mica)
Relatively few: calcite; limestone
(sporadically: basalt)
Sorting: moderate
Shapes: A - SA (schists with plate structure)
Amount of grains: 25 to 30 %
Dominant grain size: 50 μ ≤ α ≤ 1500 μ

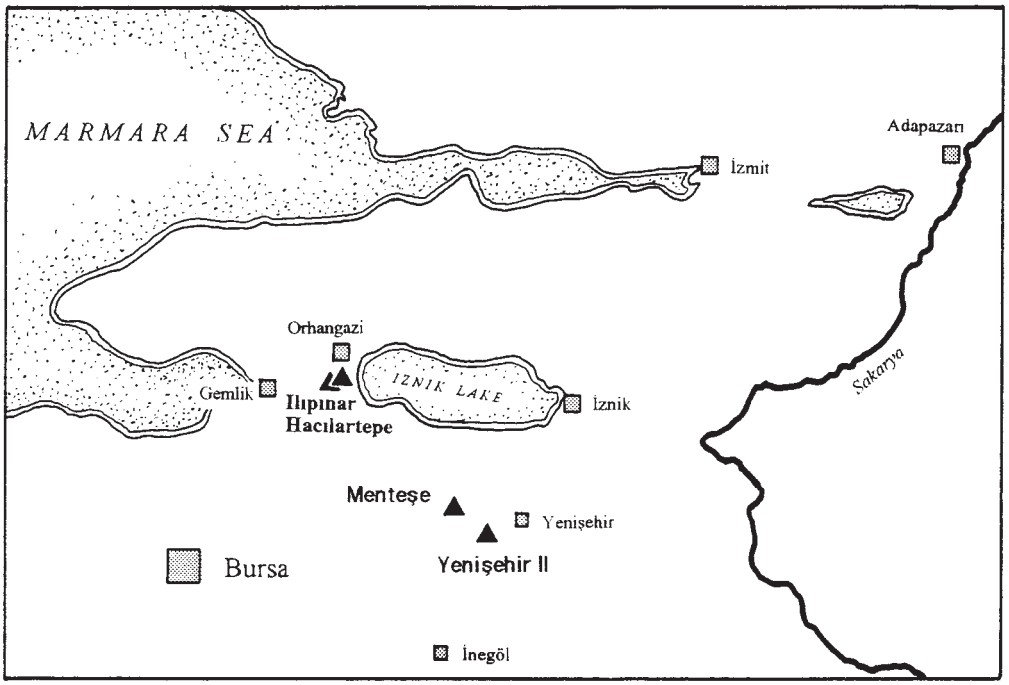

Fig. 1. Regional map

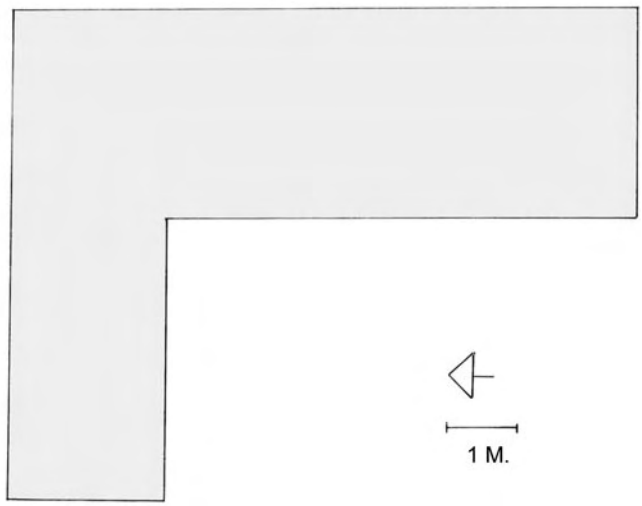

Fig. 2. Shape of sounding trench 2000

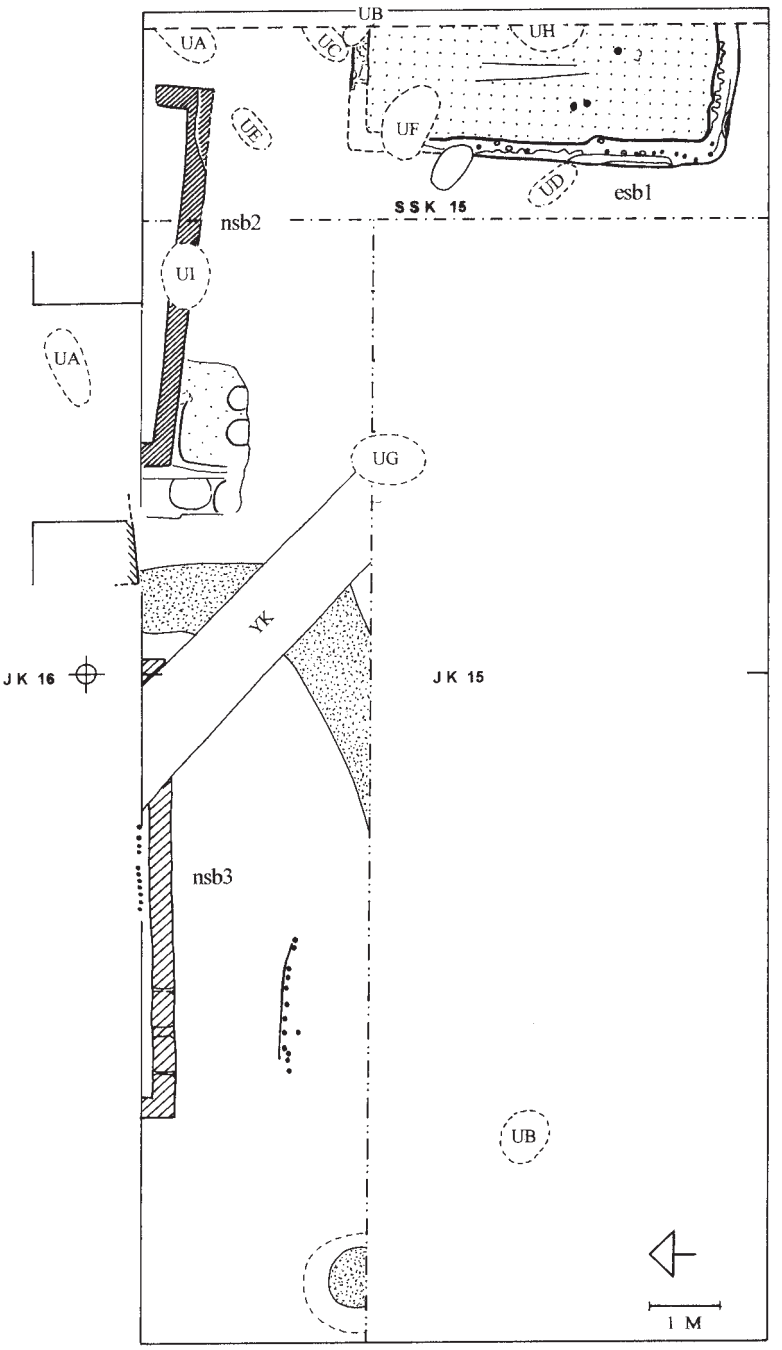

Fig. 3. Plan with three buildings; top of stratum 3.

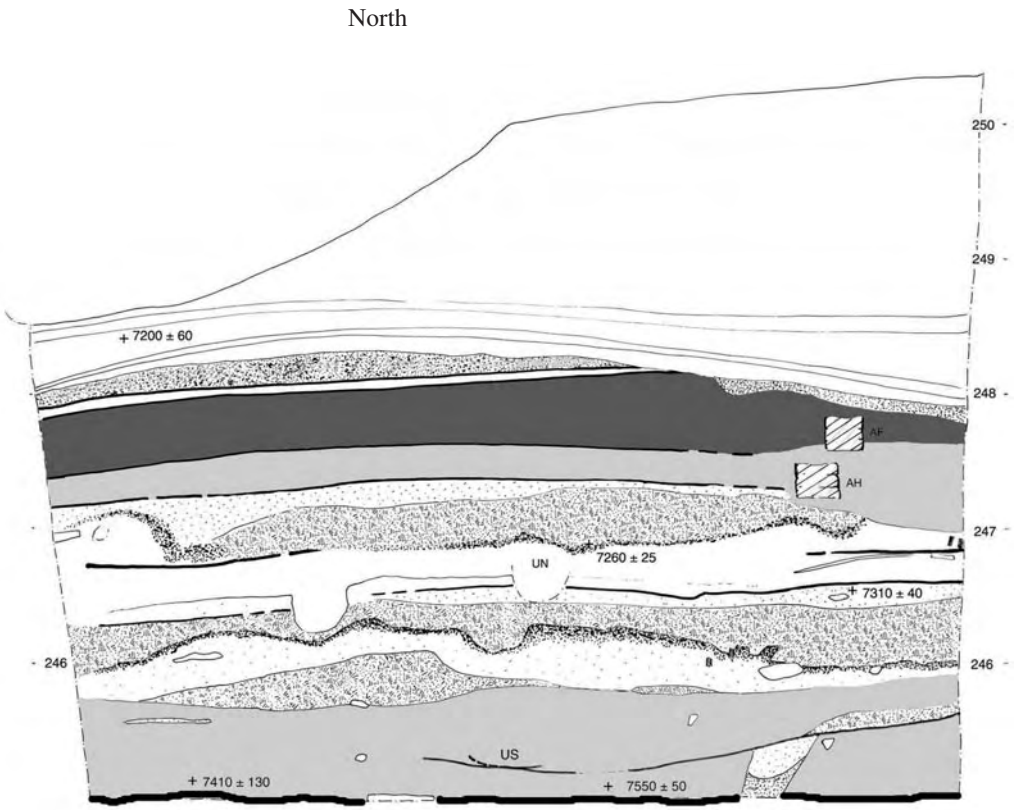
North
250
249
248
247
246
246
+ 7200 ± 60
AF
AH
UN
7260 ± 25
+ 7310 ± 40
US
+ 7410 ± 130
+ 7550 ± 50

Fig. 4. ⟶

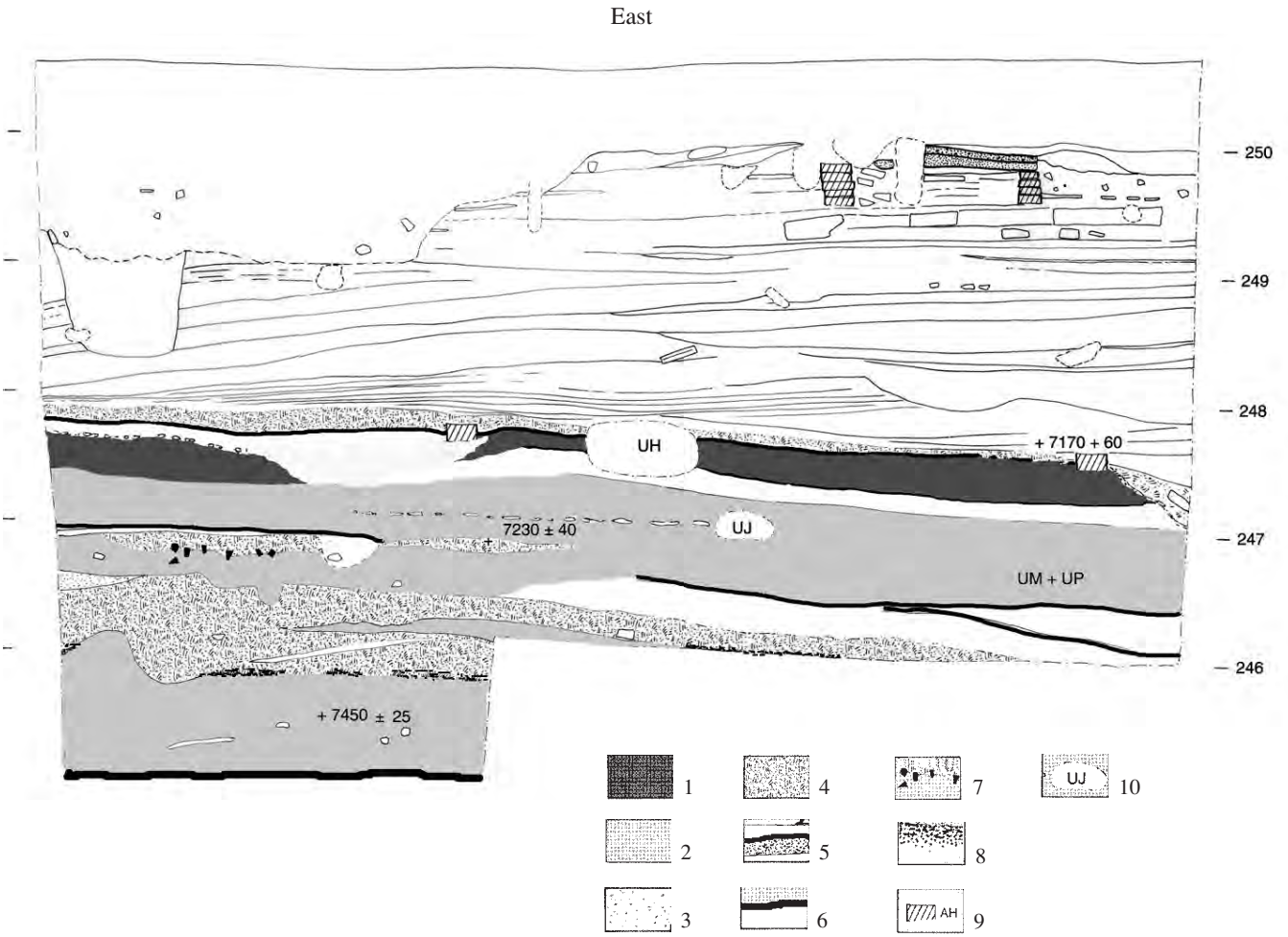

Fig. 4. North and East sections. Legenda: 1 - middle brown; 2 - middle grey; 3 - brownish mottled; 4 - red burnt mottled; 5 - floor level; 6 - top of virgin soil; 7 - charcoal pieces; 8 - ash and charcoal level; 9 - wall section; 10 - burial

Fig. 5a. Young woman's burial UK

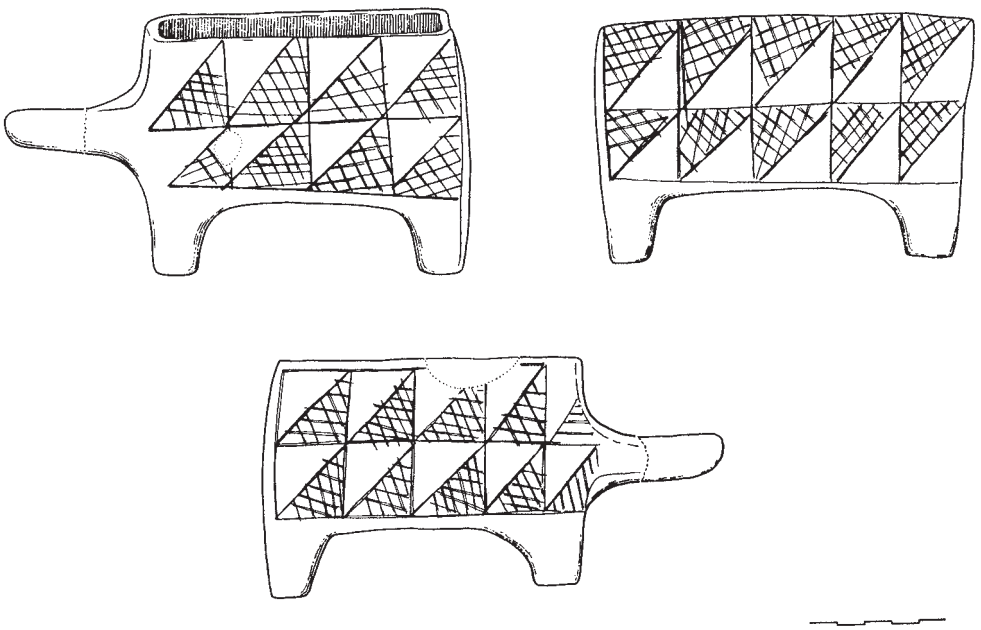

Fig. 5b. Box from burial UK

Fig. 6. Necklace of stone beads from burial UK.

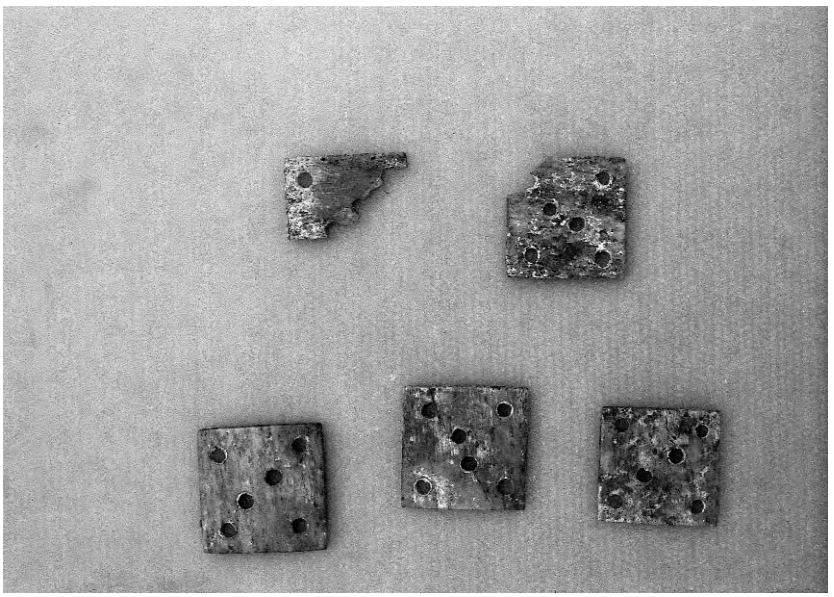

Fig. 7. Thin bone plates from child burial UJ

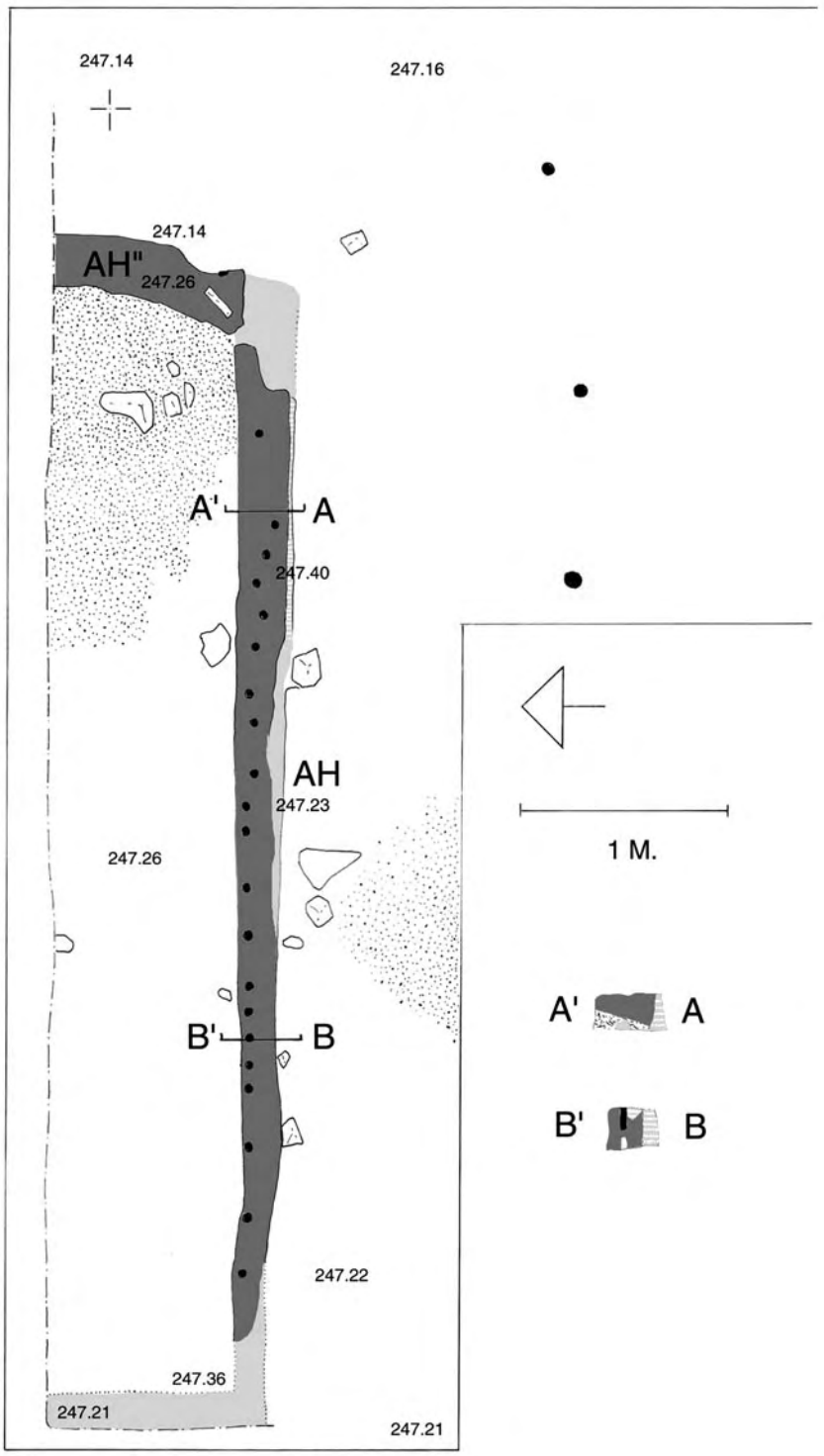

Fig. 8. Plan of building nsb4 and wall sections (stripes indicate yellow exterior coating).

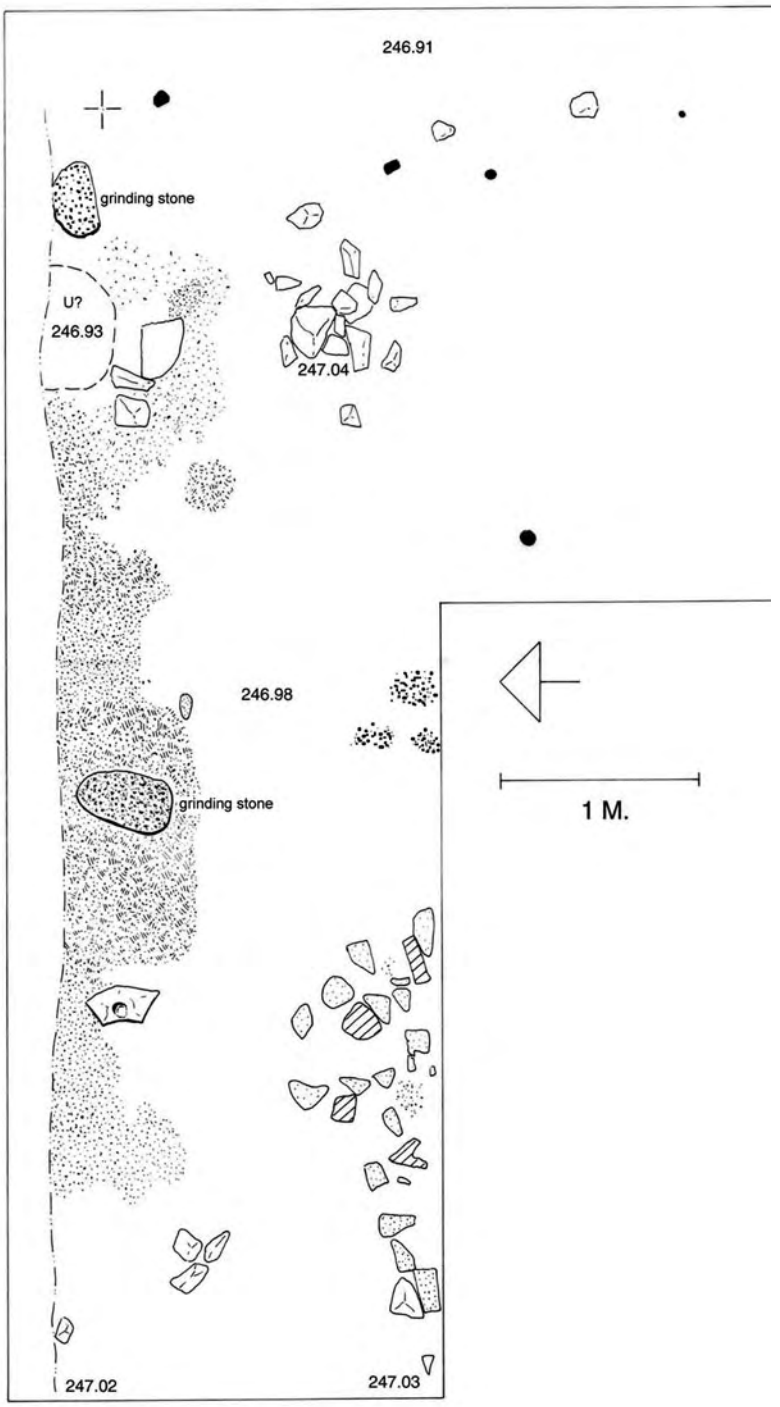

Fig. 9. Plan of trodden surface

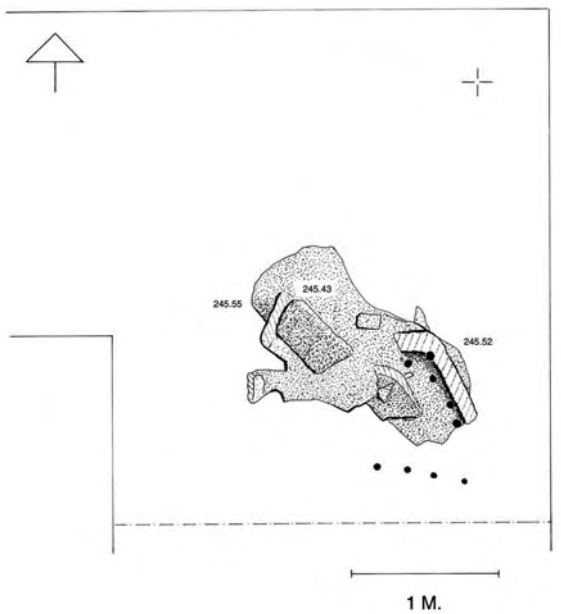

Fig. 10. Remains of a storage structure?

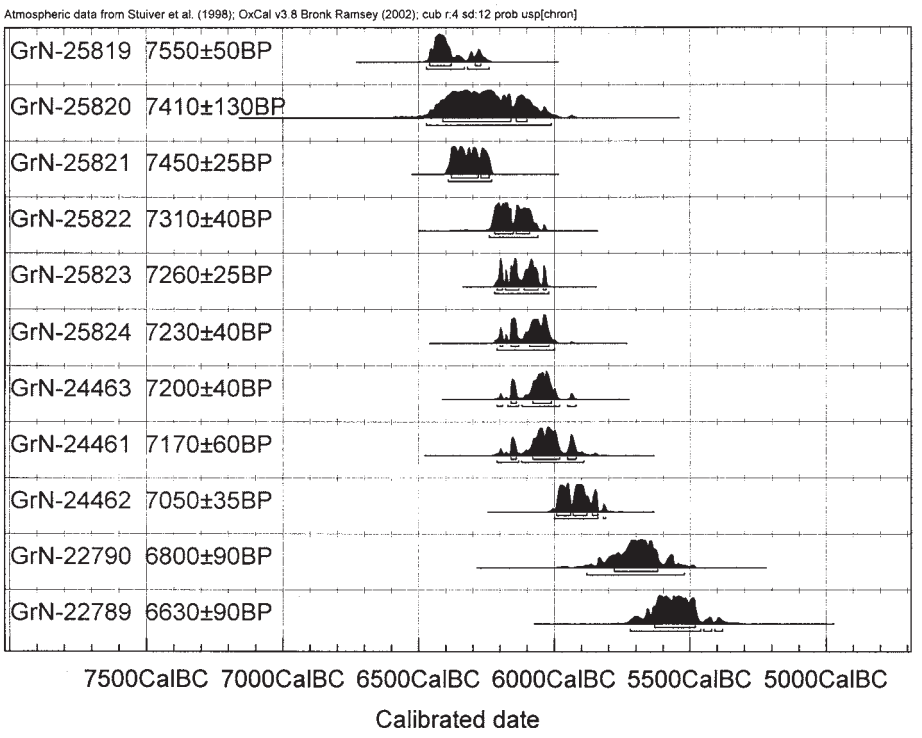

Fig. 11. All Radiocarbon datings from Menteşe

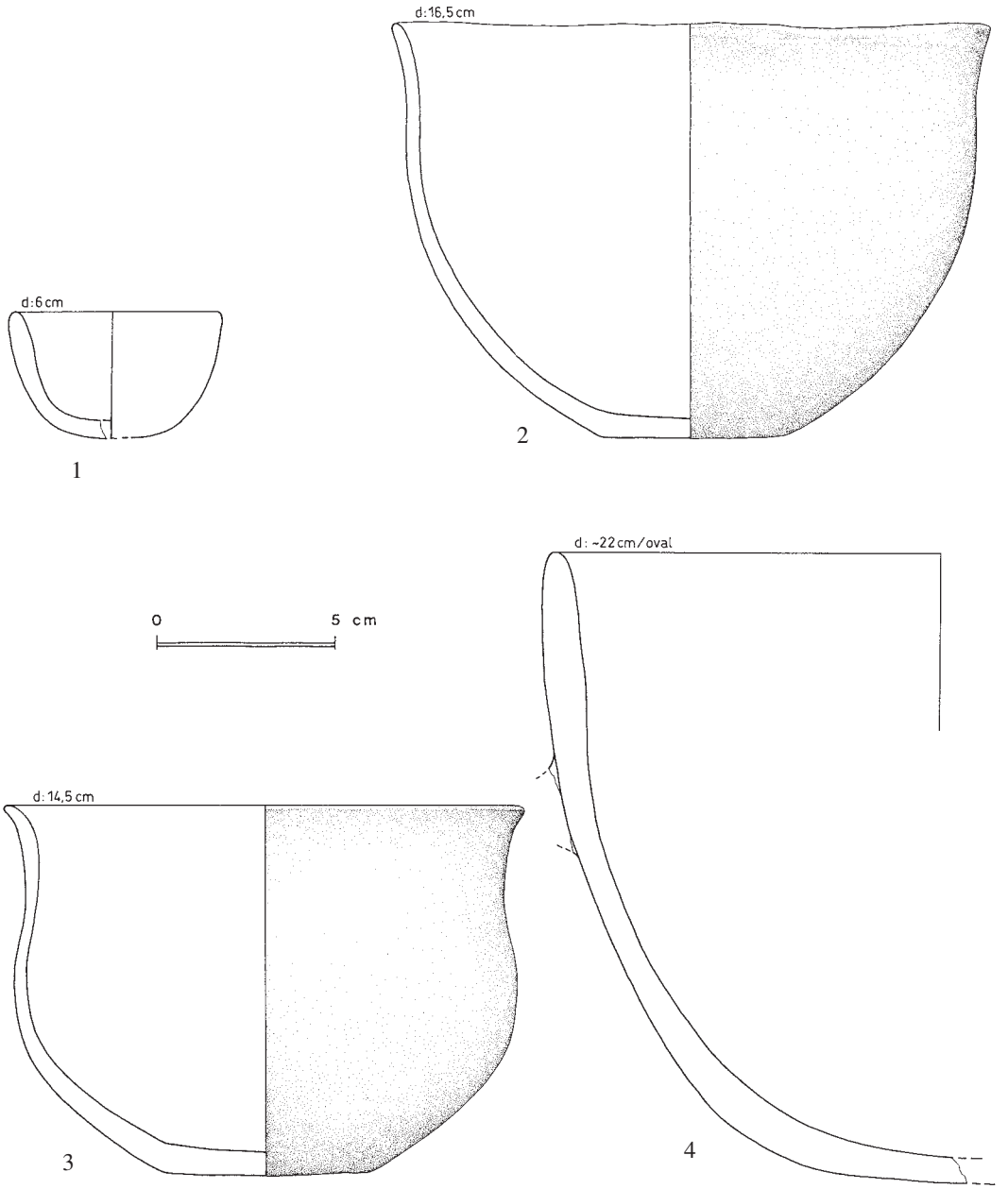

Fig. 12. Pinched pot (1); coiled restricted bowles (2;3); coiled unrestricted bowl (4)

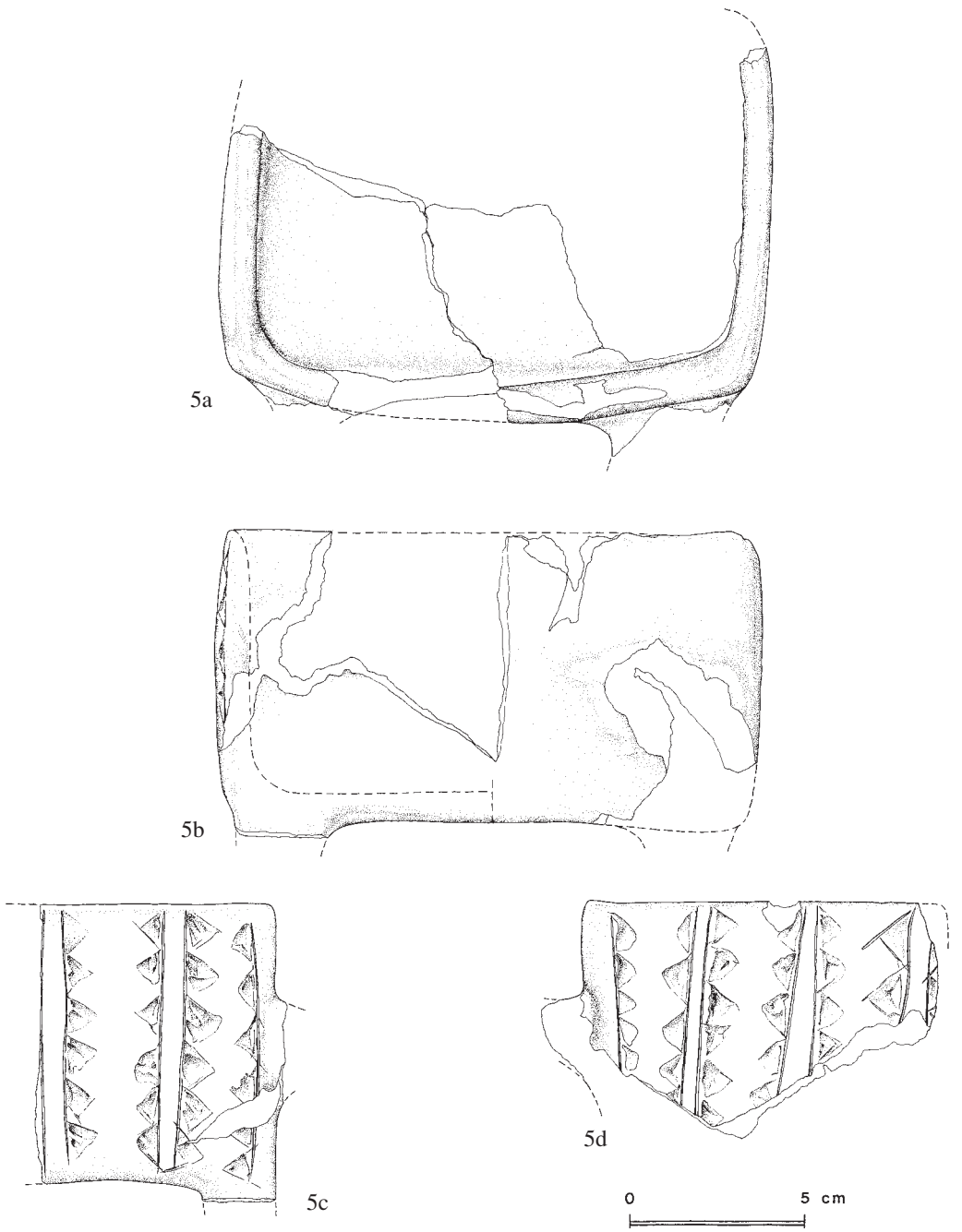

Fig. 12 (continued). Box: view from above (5a); side-views (5b, cd).

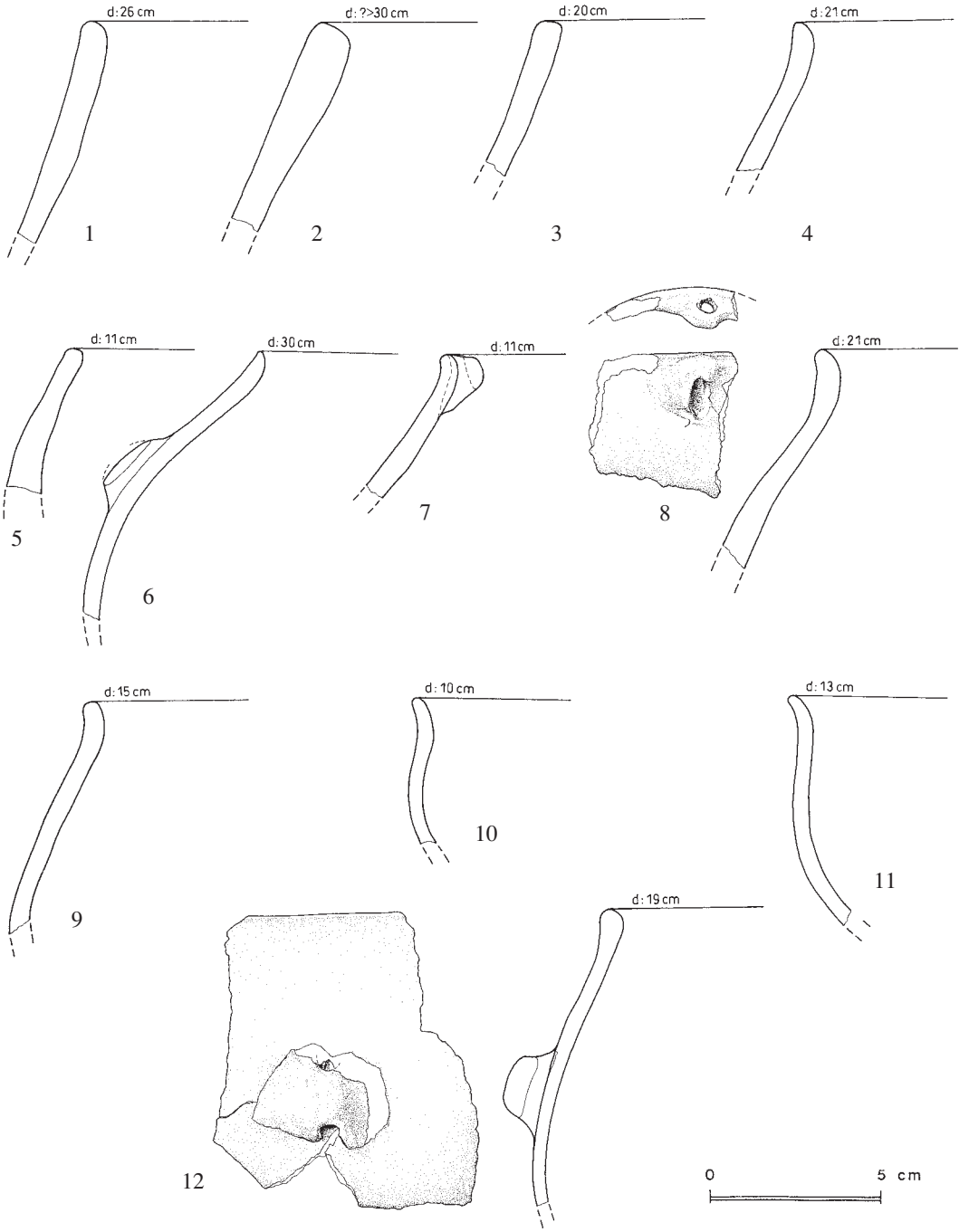

Fig. 13. Pots (1-8); restricted bowls (9-12).

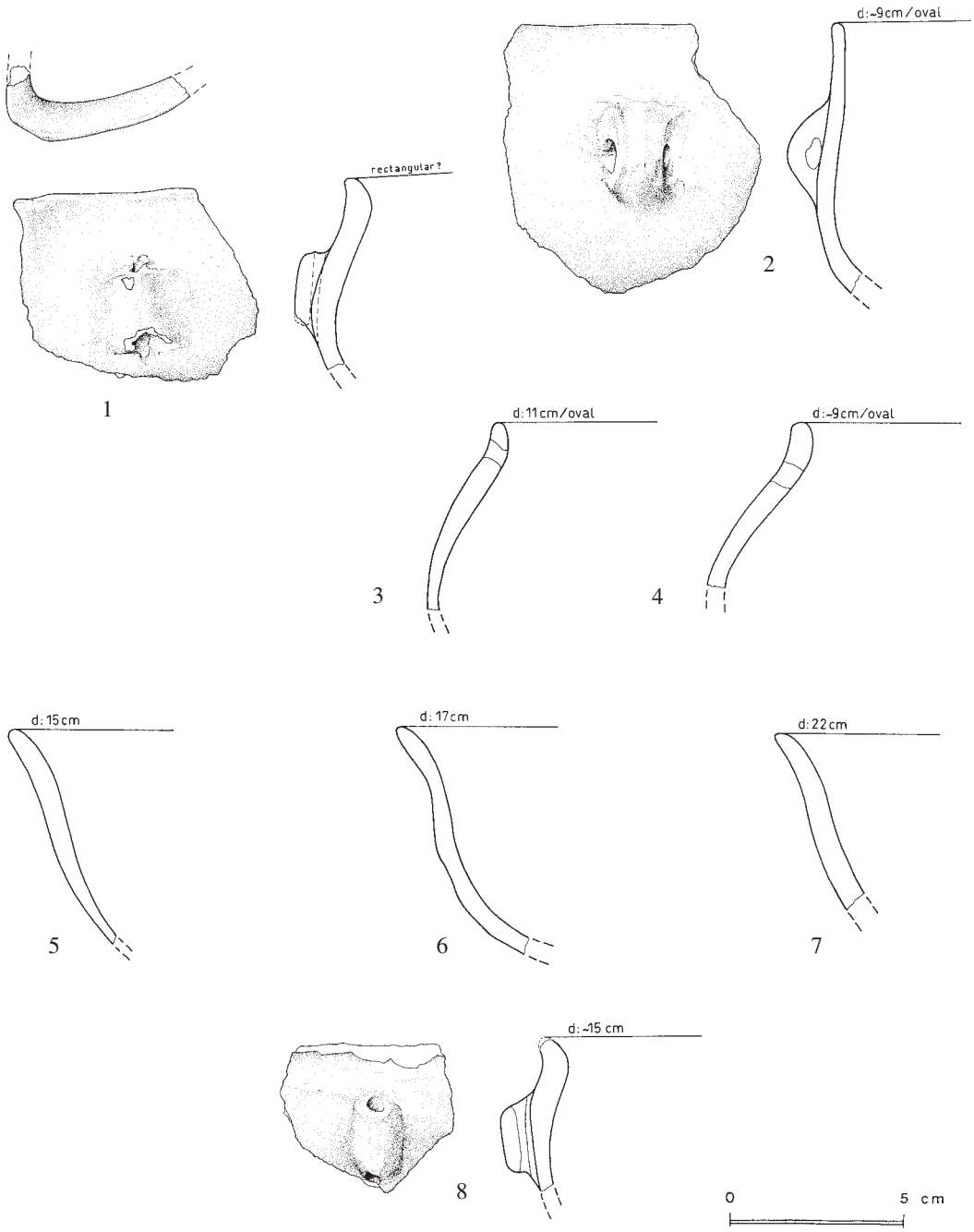

Fig. 14. Restricted bowls (1-4); unrestricted bowls

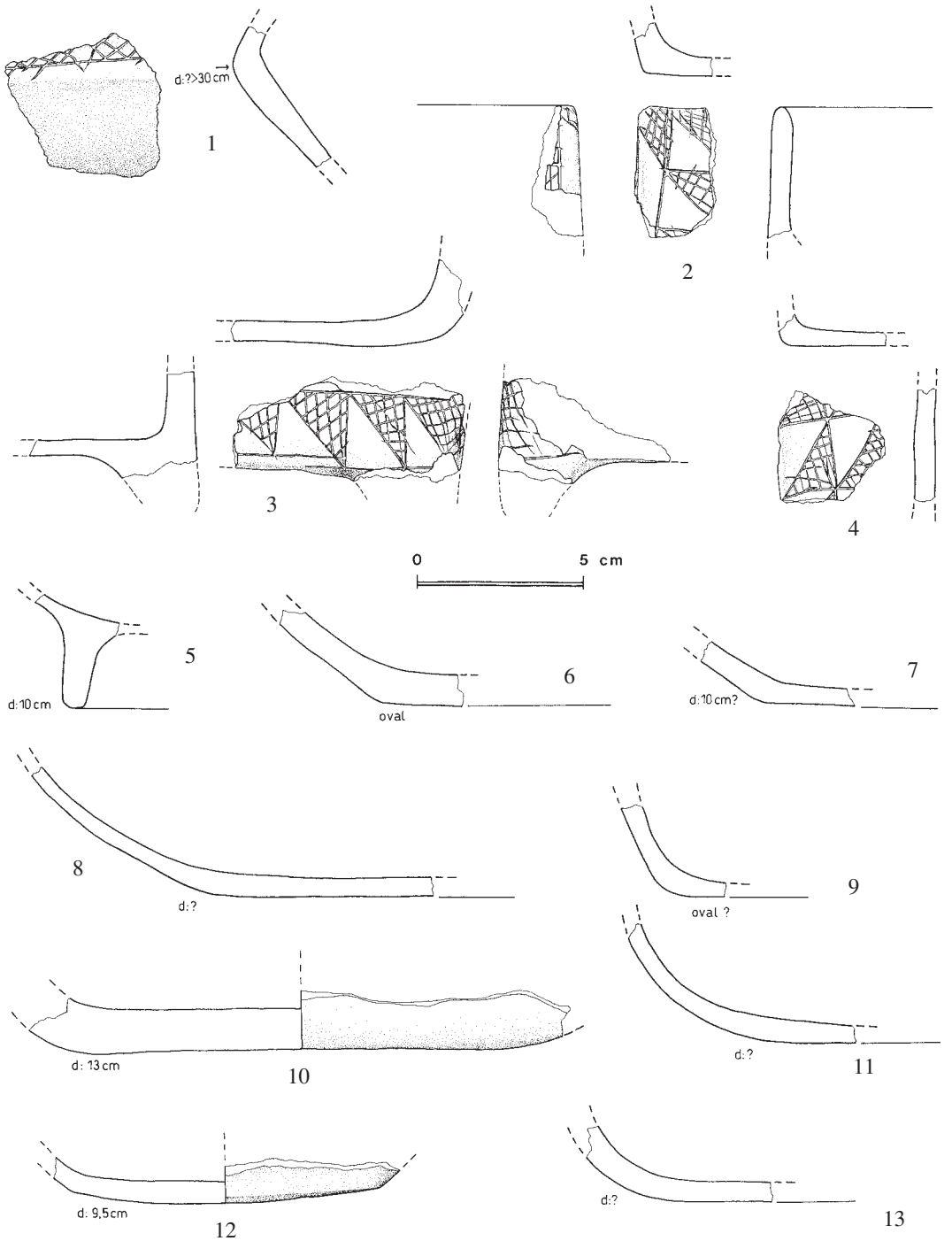

Fig. 15. Boxes (1-4); bases (5-13).

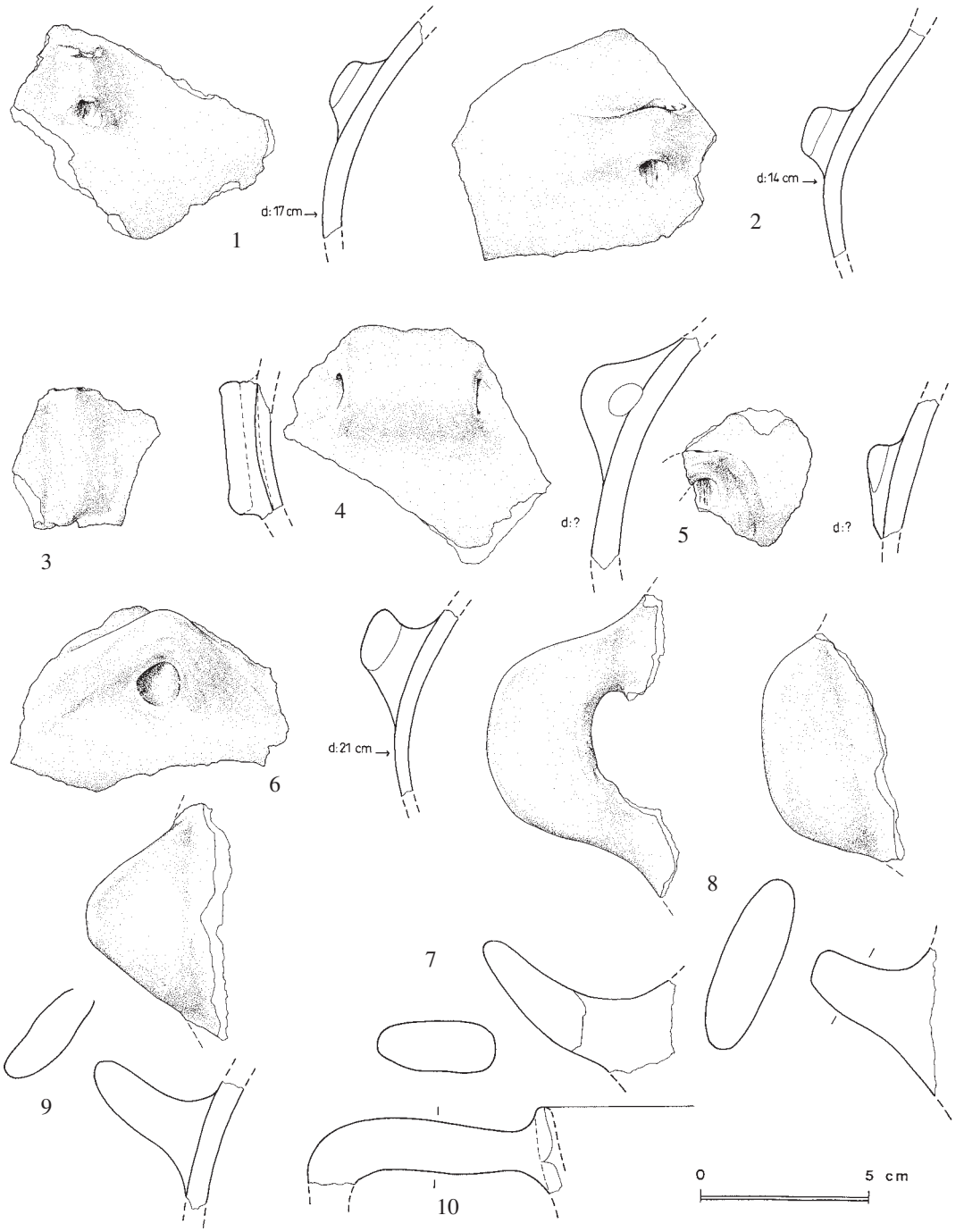

Fig. 16. Handles

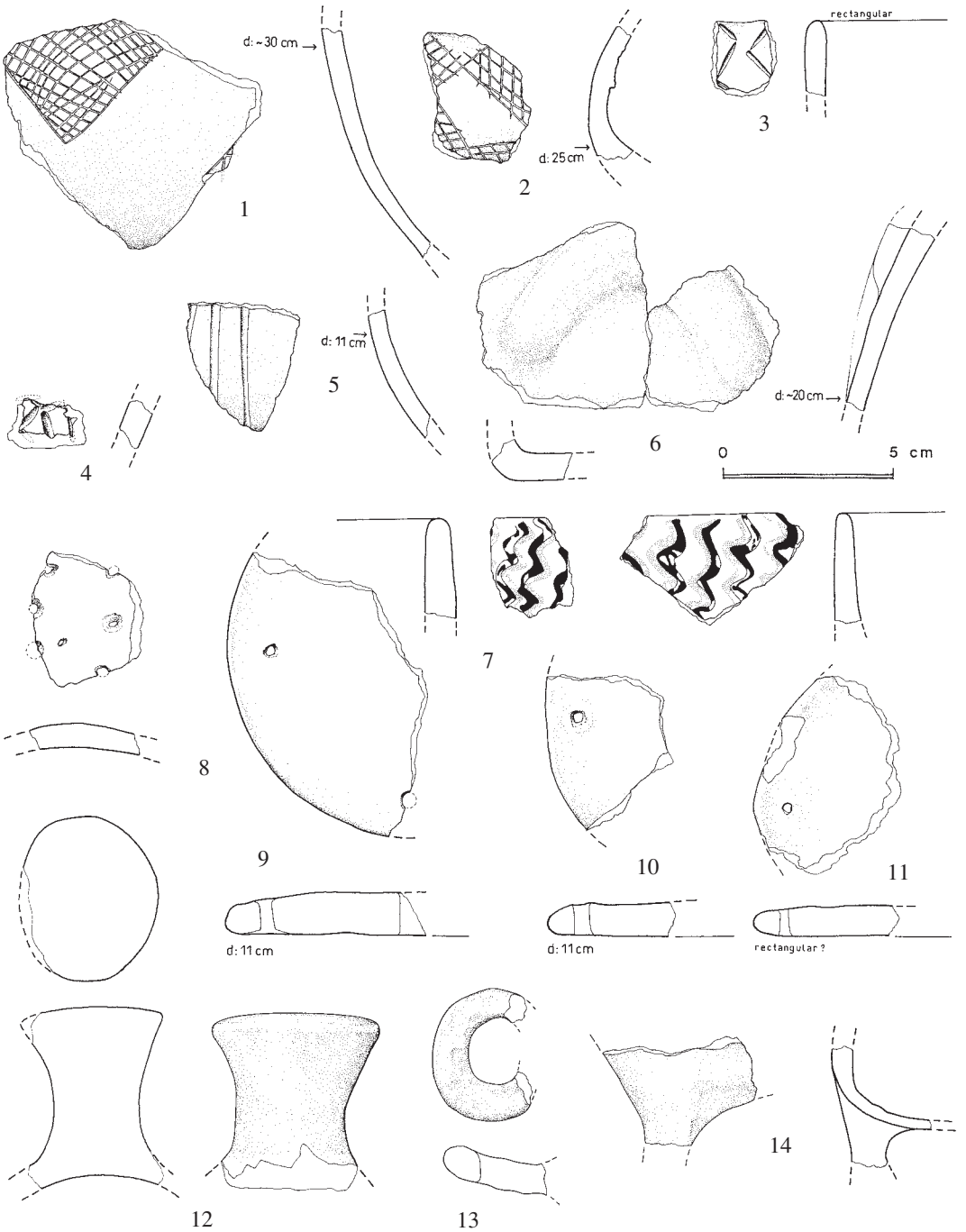

Fig. 17. Decoration (1-6); varia (7-13).

ANATOLICA XXIX, 2003

ON THE SHIFTING BORDER BETWEEN MESOPOTAMIA AND THE WEST: Seven Seasons of Joint Turkish-German Excavations at Oylum Höyük

Engin Özgen and Barbara Helwing

When approaching the modern Turkish-Syrian border from the wide plains of North-Western Syria, following the Qoueiq River, the traveller will encounter an East-West barrier at the southernmost foothills of the Taurus Mountains, the Resul Osman Dağları. Called Halep'a Bakan Dağları (literally: "the mountains looking to Aleppo") by the local population, the Resul Osman Dağları and the Kurt Dağları that run perpendicular to the former in a North-South direction form steep ridges offering a wide view over the Syrian Plain. This well-watered plain is drained to the south by the Qoueiq River and its tributaries. The Qoueiq, the ancient Xhalos River (Xenophon, Anabasis I 4, 9), passes Aleppo only to reach a dead end in the al-Matah swamps to the south. It marks the continental watershed between the Orontes tributaries to the west, that flow into the Mediterranean, and the Euphrates to the east, that form the major waterway of Mesopotamia and flowing to the Persian-Arabian Gulf.

The Plain of Kilis (Tolun 1975; Kesici 1994), as it is called on the Turkish side of the border, and the mountains that encircle it, form a natural boundary between North and South, between East and West, and between Highland and Lowland (Ritter 1843: 1687). This borderland position is also reflected in the cultural history of the region, where in some periods it forms a barrier and in others an interface between neighbouring territories. In recent years, its borderland characteristic has been reinforced by the superimposition of the modern Turkish-Syrian border. This has cut off about 400 villages on the Syrian side that previously used to depend on Kilis as their nearest market town. The town itself has since been forced into the lee of the economic flow in the region, a situation that is incomparable with that which it held in ancient times. This, no doubt, influenced modern archaeological research that overlooked much of the Kilis Plain, with the exception of some short research expeditions, even though cultural centres on the adjacent Syrian Plain such as Tell Rifa'at and Tell Akhtarine, had long been known about.

The fertile *terra rossa* soil of the Kilis Plain is now cultivated with olive plantations and vineyards (Louis 1985: 67). At regular intervals ancient settlement mounds rise above the plain (Özgen et al. 2002b). Among them is the double-summited mound of Oylum Höyük (Fig. 1), located on a small perennial stream, the Akpınar Suyu, and backed by the Resul Osman Dağları to the North. At a height of 38 m and covering an area of 17 hectares it is not only the largest on the Kilis plain but also one of the largest in all Southeastern Turkey. An

enormous cyclopean fortification wall built of basalt boulders surrounds the base of the mound. The existence of a lower town has not so far been proven but it seems probable given surface finds in the modern village that extends southeast of the mound. Oylum clearly must have formed the regional centre of the Kilis Plain from at least the fourth millennium BC. Numerous high quality small finds from the neighbourhood of Kilis that have circulated on the art market since the beginning of the 20th century (e.g., Garstang 1910: 86. 106 pl. 140, 101; Buchanan 1966: 173-174 No. 888) most probably originate from Oylum and further underline the importance of this site. The strategic importance of the place was first pointed out by U. B. Alkım during his surveys in the 1960's (Alkım 1968: 40-41) and then by a later Italian mission (Archi et al. 1971: 10. 15. 27. 87-88 No. 153).

Excavations at Oylum Höyük have been carried out since 1988 under the direction of Engin Özgen (for a bibliography of the first seasons, see Özgen et al. 1997), and since 1995 have been a joint project of Hacettepe University, Ankara, and the German Archaeological Institute, Istanbul (Özgen et al. 1996; 1997; 1999; Özgen and Helwing 2001; Özgen et al. 2001; 2002a; 2002b). These excavations have now demonstrated continuity of settlement at Oylum Höyük from at least the later fifth millennium BC to the Hellenistic period.

The primary objective of the excavations, which began as rescue excavations due to the massive looting and earth quarrying that threatened the site, has been the establishment of a regionally valid cultural sequence. Whereas comparable sequences exist to the west in the Amuq and in Cilicia (Mersin - Yumuktepe: Garstang 1953; Tarsus - Gözlükule: Goldman 1956; in the Amuq plain: Braidwood and Braidwood 1960), and to the east along the Euphrates (Kurban Höyük: Algaze 1990; Lidar Höyük: Hauptmann 1997), correlation between these remains weak due to the lack of reliable interconnection. A second objective has been the study of regional settlement history and settlement systems on the Kilis Plain, in order to understand the historical position and importance of Oylum Höyük and its satellites within the system of competing city states that flourished on the Syrian plains during the third and second millennia BC. (Klengel 1992). Finally, the continuous occupation of the site throughout the Late Bronze and Early Iron Age up until the Hellenistic period will hopefully provide new insight into developments during the "Dark Ages", when most of the other centres in Northern Syria were, at least temporarily, abandoned.

Excavation Areas

From 1995 to 2001, excavations were carried out in six major areas of the mound, and in a field to the west of the mound (Fig. 2). These areas were:

1. A step trench on the eastern slope of the mound. Excavated since 1993, this has so far revealed a stratigraphic sequence from the Late Chalcolithic to the Hellenistic period (squares X-AA11). Middle and Late Bronze Age remains were excavated on a larger scale to the north of the step trench (squares X/Y 9-10). Although not yet stratigraphically connected, a trench at the bottom of the mound below the step trench has yielded material of the 5th millennium BC but without well-preserved architectural remains.

2. It had been hoped the recover a better preserved stratigraphic sequence for the Iron Age in two trenches located on the northern mound (squares R15-16). Here, levels of the middle Iron Age were reached.
3. An impressive mudbrick building, probably the substructure of a monumental building of Hellenistic date, was found, covering an extensive area of the southwestern summit of the mound (squares L/M 25-28).
4. Late Bronze Age remains, partly disturbed by a Byzantine cemetery, were uncovered in two trenches on the southern slope immediately above the modern village (squares X41-42, Y42).
5. Soundings on the west terrace, where earth quarrying had exposed 4th millennium BC layers, uncovered evidence considerable post-Ubaid, resp. LCH occupation (squares I31b-c, I32a-c, J31c).
6. Rescue excavations in a field approximately 600 metres west of Oylum Höyük, on the west bank of the Akpınar Suyu, revealed part of a mosaic floor belonging to an early Byzantine church (trenches K01-02).

Excavation Results

Chalcolithic period

On both the eastern and the western slopes, earth quarrying has removed considerable parts of the mound, uncovering Chalcolithic layers. These layers offered the promise of easy access to the lower levels of Oylum Höyük, and, at the same time, were the most in danger. The oldest Chalcolithic remains so far encountered in excavation were uncovered in trench Z 7, below and slightly north of the eastern step trench. Here, under a thick layer of recently accumulated eroded material, remains of domestic installations, associated with painted pottery of Amuq E type, where found (Özgen et al. 1997: 63-64). As the state of preservation here was poor, it was decided to shift the focus of attention to the western terrace.

The section revealed by the villagers' earth quarrying on the western side of the mound showed Late Chalcolithic (LCH)[1] remains at the bottom (Nieuwenhuyse 2001), with layers sloping gently to the west towards the modern water course. Excavation below this section began in 1997 in three 4x4 metre grids (trenches I31b, I31c, J31c: Özgen et al. 1999). After 2000 this area was extended to the south with a 4x9 m trench because it had become too dangerous to work so close to the exposed sections (trench I32ac: Özgen and Helwing 2001: 99-109).

The oldest feature to be documented as yet in the western terrace (trench J31c) was a huge wall made of untrimmed basalt boulders (Özgen et al. 1999, fig. 2). This wall stood 5 courses high and on its eastern side had backfill composed of stones and pottery sherds with very little soil. This pottery, most of it Ubaid-related, resp. Amuq E material, was badly

[1] See Helwing 2000; Özgen, Helwing, *et al.* 1999 for a discussion of the chronological subdivision into three phases applied here.

eroded and must originate from an older settlement near by, probably somewhere below the main mound. The soil layers that had accumulated on its western side contained coba bowls. Apparently, this construction did not extend further to the north. Excavations in trench I31b have now extended below the level of the stone wall but have not revealed any evidence for its continuation here. Instead, more sloping layers of dark soil containing coba bowls were found. The function of this wall remains unknown. It may have been a platform of a type known later from LCH 2 sites such as Hacınebi. Given the proximity of the watercourse, it could also have been a construction intended to prevent flooding of the chalcolithic settlement.

Above the basalt wall were several layers of domestic architecture and installations dating to LCH 1, all of which followed the ancient slope of the land. Apparently, this part of the settlement was abandoned toward the end of LCH 1, and the area was used as a graveyard during LCH 2 before a new settlement began.

Tombs of the LCH 2 period had already been uncovered in trenches I31b and I31c. These were badly preserved due to later occupation. Both children and adults were buried here, either as simple inhumations or inside pottery vessels (Fig. 3). Excavations in trench I32ac have now revealed much better evidence for standard burial customs within a regular cemetery. Ten burials have so far been uncovered in this trench. A feature common to all of them is that the burial pit is lined at one side with a row of mudbricks. Apparently, the burial pits were not dug to true vertical, but were hollowed out to one side of a vertical shaft. Following the burial, mudbricks were used to close the chamber. The bodies were laid in a crouched position, either in a large storage vessel, or in organic containers or textile wrappings. In one instance, a straight rectangular burial lining of organic material could be discerned, probably the residue of a wooden board. There seem to have been no strict rules regarding orientation. Funerary gifts occur only very rarely. Personnel ornaments such as single beads were found, and sometimes a small bowl accompanied the dead.

Still in the LCH 2 period, the area was again occupied by a settlement. The walls of these new buildings leaned against the slope of the older mound. Preservation of the architecture was very bad and as yet, no complete building has been uncovered, but a variety of domestic installations have been noted. It is too early to decide whether these layers were parts of a standard domestic settlement, or whether were workshops and installations on the fringe of the actual settlement.

The material associated with the LCH 1 levels is characterized largely by coba bowls and by chaff tempered fabrics used particularly for the production of globular jars, some of which bear a distinctive incised decoration in herringbone pattern. In the upper levels of LCH 1, a dark gray or dark brown pottery with burnished surface appears that is restricted to specific shapes, such as bowls with multiple grooves under the rim. Stamp seals with crudely incised depictions of animal, so-called 'ear-plugs' and other polished stone implements complete the assemblage. The LCH 2 material consists largely of chaff tempered wares, sometimes with red slip on the outer surface. Casseroles and hammerhead profiled bowls are the most characteristic shapes. A small percentage of ceramics that occurs mainly in the

tombs is an untempered fine ware, sometimes with a red slip applied, used for small globular bowls and jars (Fig. 4).

During the later LCH 2, northern Syria and southeastern Turkey came increasingly under the influence of Uruk culture. The layers that would have correlated with this period are, unfortunately, not accessible on the western terrace although they were documented higher up in the artificial section (Nieuwenhuyse 2001). Our settlement history of Oylum Höyük has still a hiatus at this point.

Uruk influence is, albeit at its later state, to be seen in the lowest layers of the eastern step trench. Here, two superimposed layers of domestic architecture were uncovered on the lower step Z11/AA11 (Fig. 5). The layout of both layers was almost identical, and the walls of the upper buildings stood directly on top of or next to the walls of the lower buildings. Two houses could be distinguished, neither of which was fully exposed. Slope erosion had destroyed the eastern parts of the buildings, and to the south, east and north, the houses extend beyond the limit of excavation.

The houses were constructed of rectangular mudbricks on top of foundations made of a single course of irregular stones. The preservation of the mudbricks was poor, standing to a maximum of only one to two courses and were badly torn. It seems that the walls were sheared off, and consequently the bricks appear twisted. Similar observations have been made at other late 4th mill. BC sites, such as Hassek Höyük (Behm-Blancke 1992: 1).

In the upper phase, the northern building consisted of two rooms. One was a large room with a round hearth with a central depression. Inside this depression stood a beveled rim bowl, apparently to keep glowing coals overnight. A thin buttress attached to the southern wall separated off the southeastern corner of the room. The floor was made from beaten earth and was painted white. The much smaller southern room had no such floor, and its southern wall was preserved only as a single course of stones. From the southern building, the corners of two rooms have been uncovered. Again, only the foundations were preserved. The southern building was oriented slightly more to the north in comparison to the northern building. The open space between to the two buildings was apparently open air, probably an alley. Its surface consisted of very hard mud and contained a lot of rubbish, pottery fragments and animal bones.

The lower building phase had a similar layout, except that the northern building lacked a dividing wall and only one large room was exposed. The open alleyway between the two buildings remained equally the same. Close to the entrance of this room the burial of a neonate was found. A second neonate burial had been interred next to the southern wall.
In the upper phase, floors had apparently been swept clean, and almost no *in situ* material remained to be found. This is different to the lower phase, where a full pottery assemblage was recovered. In particular the small room in the southeastern corner of the trench contained plentiful pottery, some of which had apparently been wrapped in organic material, such as a mat or basket. White organic fibers where observed between the crushed pottery vessels. The large room of the northern building also yielded a full range of vessels lying on the floor. Furthermore, animal metapodia and bone tools were found.

The pottery assemblage discovered from these two building phases consisted largely of chaff tempered fabrics, alongside a fine ware with clinky appearance and some fine, mineral tempered material. With regard to shape, bevelled rim bowls are abundant, and most of the other forms belong to the Uruk range of shapes: nose lugged jars, droop spout bottles and small conical beakers are familiar from sites on the Euphrates. However, hammerhead profiled bowls and biconical bowls occur that also link the assemblage to the Syro-Anatolian LCH.

Early Bronze Age

The transition from the Late Chalcolithic to the Early Bronze Age (EBA) appears to take gradually at Oylum Höyük. Above the two LCH building layers were two more distinct building layers, preserved only in the western most part of trench Z 11. As had been the case with the earlier building levels, the walls were constructed from mudbrick on single course of stone foundations. The pottery associated with them does not show any abrupt change in the repertoire of forms and fabrics. Instead a slow and constant replacement of older traditions with newer ones can be observed. A large part of the assemblage was now made from a light coloured fabric, and reserved slip, a decoration technique well known in the LCH assemblage, was now applied to these light coloured, mineral tempered vessels. The shape of nose lugged jars changed until they resembled the well-known EBA 1 goblets from Hacınebi, and Hassek Höyük.

These building layers were sealed on top by a pavement made from untrimmed flat basalt boulders. This marked the end of the early EBA occupation of this part of the site. Above this were approximately 2.50 m of accumulated cultural layers that contained tombs of the later EBA. Some architectural remains were also found but had been heavily damaged by the construction of tombs.

Richly equipped chamber tombs had been noted at Oylum Höyük prior to the beginning of excavations. It was because of the looting of one of these chamber tombs by villagers that rescue excavations were initiated in 1988. Up until now five large chamber tombs have been excavated in the eastern step trench in squares Y-Z 11. All of these tombs were oriented north-south, with an entrance from the south. They were constructed of limestone boulders built in the dry wall technique. Two larger upright limestone slabs flanked the entrance. Where preserved, the roofs of the chamber tombs consisted of long stone slabs. In one case, however, a single course of mudbricks was preserved on top of the stone wall, suggesting that mudbrick constructions, e.g. a vault, may have been an alternative method of roofing. The size of the chambers varied, with lengths of 2-3 m, and widths of 1,5-2 m. Most of the chamber tombs at Oylum Höyük were looted in antiquity and the grave contexts disturbed. However, as some graves did contain some skeletal remains it is clear that the chamber tombs had been used for multiple burials, and whenever a new body was interred the earlier ones were pushed aside. Therefore, only the last skeleton to be buried lay in its correct anatomical arrangement, while the others were more or less scattered. The tombs contained skeletons of both sexes and different age groups, including small children.

Around and between the chamber tombs were single burials, often directly attached to the chambers. Adult graves were as pithos burials or in stone cists, with bodies laid in a crouched position. Children were mostly buried inside a jar, also in a sleeping position. These single burials appear to have been interred without adhering to any strict rules regarding their orientation. The preservation of the single adult tombs was better than that of the chamber tombs, as they apparently did not present a target for looters. They were usually equipped with large amounts of pottery, with small corrugated beakers, shallow bowls and fruit stands being the most characteristic shapes. The assemblages appear to represent serving vessels, either related to the burial ceremony or intended to provide for the deceased in the afterlife. Sometimes, personal adornments accompanied the skeleton, such as toggle pins, hair rings, and occasionally seals. These finds date of the cemetery securely to the EBA 3-4 period. There is as yet no clear relationship between the EBA tombs and the architectural remains found next to them, especially in the trenches north of the step trench, squares Y10-9. Here, the remains of a large building with small agglutinating rooms that had been destroyed in a fire were uncovered. In trench Y11 further to the south, numerous small installations, hearths, pebble pavements and flimsy hut-like constructions were observed and these are probably related to burial cult. Following the EBA period, it seems that this part of the mound at least was temporarily abandoned. The surface of the ancient mound here can easily be distinguished because of its hard texture. It slopes down to the west toward the interior of the mound.

Middle Bronze Age

When the eastern part of the mound was resettled during the latter part of the Middle Bronze Age (MBA), some of the previous EBA chamber tombs must still have been visible on the surface. The walls of the MBA settlement leaned on the slope of the older EBA mound and form a terraced structure. Their foundations extended below the upper level of the EBA chamber tombs, and in one case an MBA wall clearly respects an older monument.
The walls of the MBA settlement ran in line with the older slope and were oriented roughly northwest-southeast. A street climbed up the slope from the south, separating two large buildings and ending before a perpendicular wall connecting the two buildings. Two building phases could be distinguished, and each of these had several sub-phases. The buildings were constructed mostly of untrimmed basalt boulders, set carefully in two parallel lines, with small stones used as fill in between. These walls could reach Č m in height. Ceramic tubes lying at right angles to the walls served to drain water from the interior of the building out into the street. The upper part of the walls must have been constructed from mudbrick, judging by partially preserved mudbrick remains.

In the lower building phases, the building east of the street consisted of at least four rooms. Parts of three rooms were documented from south to north, none of which had an intact floor level. The next room to the north differed from the others in that it had a floor made from white lime and fine gravel, which appears to have been preserved because it was surrounded by a row of extremely large rectangular mudbricks. These mudbricks may either have been walls, or just the remains of a bench that ran around the room. A large storage

vessel was sunk into the floor, so that only its rim was visible. Scattered on the floor were several pottery vessels, probably the contents of a kitchen. Further to the north there followed an open courtyard (Fig. 6). This was the first room in which at least part of its eastern wall was preserved. The courtyard was accessible from the west via a threshold constructed from trimmed basalt slabs. In its northern wall, another door was partly preserved, with a single upright trimmed basalt stone forming the left side of the doorway. The right side of he doorway was not preserved. The northern third of the courtyard was paved with huge, irregular flat basalt boulders. On this stood a limestone tub. In the unpaved part of the courtyard, a large limestone grinding plate and a round hearth made of coarse basalt formed the major installations. North of the courtyard was a second paved outdoor area. West of this pavement had been another room. The floor level of this room lay more than 1 m below the level of the pavement. The room had been filled with pottery and small finds and apparently had originally been a cellar.

A second such cellar must have belonged to the building west of the street. This cellar (Fig. 7) contained eight storage vessels that had apparently stood on benches along the walls. When the building burnt down, the vessels fell into the room. This cellar connects to a wall lining the western side of the street that belongs to the upper building phase but no rooms or floors connected to this wall were preserved. Stratigraphically the wall overlies a smaller rectangular room that could not be connected to any of the other structures. This room had very carefully constructed thick walls and a floor made of several layers of stones and was then covered with a pavement of fine gravel. The northern wall was disturbed by a silo cut from a higher level. This room was used for depositing burials: thrown into the room from the west, bones and articulated body parts formed a thick heap at the eastern end of the room (Özgen - Helwing 2001, fig. 4). A total of 18 individuals could be distinguished, but none lay in anatomically correct positions. A broken bottle and a cylinder seal of extraordinary quality (Fig. 8) were the only burial goods.

The upper building phase followed roughly the same outline as the lower one but was much less well preserved. Worth mentioning is a small limestone relief found on the upper level of the street (Fig. 9).

The MBA level also yielded a large number of other burials. Most of these were child burials, either as simple inhumations or in jars. Adult burials occur much less frequently and appear as simple inhumations or are covered by pithos fragments. Burials were occasionally accompanied by pottery vessels and items of personal ornament such as pins, rings and beads, but in general the MBA graves are poorly equipped when compared to those of the EBA. Pottery found in the MBA building levels is largely sand tempered and wheel-thrown dating to the second half of the MBA. It occurs alongside other pottery types such as a gray or black burnished fabric that was used exclusively for plates and bowls. Only a small percentage of the pottery is painted. The small finds, seals and the limestone relief mentioned above confirm a date in MBA II.

Late Bronze Age to Iron Age

Remains dating from the Late Bronze Age (LBA) were found in the eastern step trench in quadrant Y11, but were preserved on only a limited scale due to heavy erosion on the steep slope, so two new trenches (X41a; XY42) were opened on the southern slope in 2000 (for a detailed description, see Özgen and Helwing 2001), in an area that had already yielded rich Bronze Age surface finds. In the upper trench X41, a relatively recent house was found and below that a cemetery of Late Antique or early Byzantine date. A similar, but less well preserved sequence was found in the larger trench XY42. Below this, two phases of settlement occupation were identified (Fig. 10). The later phase was dug into the slope from above and cut into an earlier Bronze Age occupation that was itself badly disturbed by pits and silos. However, in an undisturbed room context one stamped *bulla* was found and a sculpture of a human head made of coarse basalt was found in one of the pits. The head is of a bearded male with conical hat (Özgen - Helwing 2001, fig. 32).

So far the transition from LBA to Early Iron Age has been documented in only a limited area of trench Y11 in the eastern step trench. This was followed by several Iron Age building layers in trench WX11 (for a detailed description of the Iron Age excavations, see Özgen et al. 1997). These layers reflect village-style architecture with domestic installations, hearths, tandirs and mortar stones. Enormous silos dug into these layers during the Hellenistic period heavily disturbed the upper part of the sequence in the eastern trench. It was hoped that there would be better preservation in a trench on the northeastern plateau, R15-16. Here, a Hellenistic building covered the Iron Age levels. This Hellenistic building had itself been badly damaged by agricultural work on the mound plateau. Again, Hellenistic pits cut deep into the underlying Iron Age layers, and excavations here were halted in 1998.

We can therefore state that the crucial transition from Late Bronze to Early Iron Age does exist in the cultural sequence at Oylum Höyük, but that it has not yet been accessible to large-scale excavation. It is hoped that in the future larger operations on the southwestern plateau of the mound will help bridge this gap.

Hellenistic Period

In trenches LM 25-27 part of a massive building complex constructed almost entirely of square mudbricks was uncovered (Fig. 11, comp. Özgen and Helwing 2001). The walls of this building were 1.80 m wide. They formed the outline of small cell-like rooms. Neither floors nor any material belonging into these small 'rooms' can be discerned. In fact it appears that these 'rooms' never had a floor and that the building as excavated is the substructure beneath a larger building above, now lost. No exact date or function for the building has yet been established, and a more detailed investigation of the area is planned for the coming years.

Late Antique - Byzantine Period

No settlement remains later than the Hellenistic period have been found on the mound. A graveyard with tombs oriented east-west and arranged in parallel rows, each containing a extended burial with sparse burial goods, was found on the southern slope in trenches X41 and XY42. This graveyard has so far yielded a total of 16 tombs of both adults and children. At this time the settlement itself must have shifted to the western side of the river. Villagers have reported numerous coins and other small finds collected from their fields on the western terrace of the Akpınar. In 1999, a column base was found during plowing, and subsequently the field was surveyed with a metal detector and illegal excavations begun. At a depth of about 90 cm the looting pits hit a mosaic floor and consequently part of the 1999 season was devoted to a rescue excavations in this field.

A 9x19 m area was opened. The subsoil had been completely disturbed by cultivation and contained abundant iron nails and roof tiles. The mosaic floor uncovered beneath this fill was best preserved in the southwestern area, and partly destroyed in the northeast because where it was closer to the surface. This floor must have belonged to a church with three aisles, separated from each other by a row of columns. Within the excavation area (Fig. 12), a row of five column bases stretching in east-west direction, and the western outer wall of the church and threshold was uncovered. The other limits of the church must lie outside the trench but we can calculate, using measurements based on the mosaic motifs, that the part of the church so far uncovered is no more than one-third of the original whole.

The tesserae used for the construction of the mosaic floor are about 1 x 1 cm in size and colours include several shades of white, yellow, red and black. Patterns were arranged in rectangles and sometimes surrounded by a bordure. They consist of lozenges, squares, zigzags, checkerboard patterns, Maltese crosses and bands with alternating lilies. The area in the centre of the church had a more complex motif of interconnected medallions. These motifs, and thereby the church itself, can be compared to other north Syrian churches of the 5th and 6th century, as known from Antioch and Apamea (Levi 1947; Gisler and Huwiler, M. 1984; Campbell 1988). Among the finds collected from the fill were two bronze crosses (Özgen – Helwing 2001, fig. 47, c-d).

One adult grave was found in the side aisle, immediately below the floor. The tomb pit had been dug through the floor and the mosaic had been repaired, albeit badly, afterwards. Three more burials where found in a limestone sarcophagus next to the threshold. The sarcophagus had been looted in antiquity by breaking in its side wall. The upper part of the skeletons, where jewelry must originally have been placed, was missing.

Oylum Höyük In Perspective

Excavations at Oylum Höyük have so far provided evidence for the continuous occupation of the mound from the final Neolithic, that is the Halaf period, until Hellenistic times, with a gap in the excavated sequence only at the beginning of the MBA. At the end of the Hellenistic period, the settlement apparently moved to the other side of the river and the

mound was then only used as a cemetery. Oylum's place within the larger regional context can only be understood through a broader discussion of cultural developments in the Syro-Anatolian borderlands through the ages.

The oldest documented material comes from the Halaf period, but was only found in a secondary context. The earliest excavated material from the base of the eastern step trench belongs to Amuq E period and is characterized by hand made polychrome painted pottery. This assemblage represents a regional variant of an Ubaid-related Chalcolithic, first been encountered in the Tell Kurdu excavations (Braidwood and Braidwood 1960), and in the Islahiye region (Waechter et al. 1951; Alkım 1968). The associated monochrome painted pottery allows the material from Oylum to be correlated with that of Hammam et-Turkman IVa/b (Akkermans 1988a;1988c).

The Chalcolithic culture of the Syro-Anatolian Taurus foothills has long been recognized as a development related to the emerging complex policies of the Mesopotamian Ubaid culture. Therefore, models of cultural contact originally used to explain the northern expansion of the Uruk culture were projected backwards onto Ubaid-related elements in Syro-Anatolian sites. From this perspective, an asymmetrical relationship between a culturally advanced south and an underdeveloped north was postulated (Sürenhagen 1986; Oates 1990; 1993). It has recently become increasingly evident that none of these cultural transfer models can adequately describe the relationship between northern and southern sites and instead strong local continuity can be traced in the cultural development of the Taurus foothills. From the Halaf period onwards regional centres developed, of which Domuztepe and Kazane Höyük are just two examples (Bernbeck et al. 1999; Campbell et al. 1999). It seems that these "mega sites" drew their importance from their strategic positions as "gateway communities". At Oylum Höyük the 300 metres between the Amuq E layers of eastern terrace and the Late Chalcolithic features on the western terrace make it unclear whether these represent two phases of a single continuous settlement occupation or not. Given this uncertainty, it is could well be possible that Oylum Höyük represents another such prehistoric "mega site".

At Oylum Höyük, the western terrace has a full cultural sequence from the end of the Ubaid to the beginning of the Uruk culture. Contemporary sequences are so far only known from Arslantepe, periods VIII and VII (Frangipane 1993; Trufelli 1997) and from Sakçagözü (Taylor et al. 1950; Akkermans 1988c). The discovery of a platform or terrace wall in the lower layers of the western terrace makes it one of the earliest ever found.

The material culture associated with these layers is highly distinctive with coba bowls making up more than 50 percent of the assemblage. The strong emphasis on mass produced pottery marks important changes in the organization of craft activities in a way that is usually thought to relate to the emergence of complex societies (Trufelli 1994). Besides coba bowls, hand made pottery with a brushed surface and incised zigzag decoration and a gray burnished ware are also typical. This characteristic decoration is equally typical for Arslantepe VIII (Trufelli 1997: 10 fig. 13), Sakçagözü IVA (Taylor et al. 1950: fig. 17, 13-14), Tell eş-Şeyh I (Taylor et al. 1950: 97), in the Amuq (Braidwood and Braidwood 1960: pl. 25, 24-25) and the Elbistan plain (Brown 1967: fig. 3, 10). To date, it has not been found east of the Euphrates. The gray burnished ware from the upper LCH 1 levels can be compared to

Hammam et-Turkman VB (Akkermans 1988b: pl. 105, 186. pl. 106, 187-189) and Sakçagözü V (Taylor et al. 1950: fig. 19, 18). Stamp seals with crudely incised animal depictions, so-called ear-plugs and other polished stone implements are all best compared to Amuq F-material (Braidwood and Braidwood 1960: fig. 191, 197 for the seal. - fig. 192 for "studs".). The Oylum Höyük assemblage therefore reflects strong connections to the north and east. Comparisons to sites further west are less evident: in the Amuq, Tell Kurdu has a similar range of small finds, but in Cilicia, comparisons are restricted only to coba bowls (Garstang 1953).

The Late Chalcolithic graveyard that followed on from the settlement is so far unique in Southeastern Turkey. The distinctive tomb construction differs markedly from other tombs of the LCH period. Similar features are known from Tepe Gawra, where more then 400 graves and tombs of the fifth to fourth millennia BC were uncovered. Here, alongside well furnished and elaborate mudbrick chamber tombs, stone cist tombs and pithos burials, simple inhumations and urns also frequently occur (Tobler 1950: 98-125; Forest 1983). One group of Gawra graves, occurring most frequently in the earlier part of periods XI-A to IX, is characterized by a single wall of mudbrick along one side of the skeleton (Tobler 1950: 108-109). The only available photograph shows that on one side of a grave the mudbricks lie end-on and at an oblique angle, therefore they do not appear to have formed a proper wall (Tobler 1950: pl. 66b). Despite this difference, such graves do resemble the constructions observed at Oylum Höyük. The function of the wall remained unclear to the excavators at Gawra - probably due to the fact that the shafts leading to the tombs had not been noted during excavation. In one case matting covered the body, another feature linking the Gawra graves to those at Oylum.

Following the graveyard, the LCH 2 settlement yielded material that fits neatly into the Syro-Anatolian LCH. Most characteristic among this material is chaff tempered pottery first described as being typical for the Amuq F phase, that now helps to link Oylum to a large group of LCH 2 settlements with similar assemblages, such as Hacınebi A-B1 (Stein et al. 1996), Arslantepe VII (Frangipane 1993; 2000) and many others. More precisely, the high quantity of red slipped pottery with burnished surface allows us to place the Oylum assemblage with the western Euphrates LCH 2 (Frangipane 1993). In this period cultural developments in Syria and Eastern Anatolia appear to have unfolded independently of any developments in Mesopotamia, and regional handicraft traditions can be distinguished.

During the later LCH 2 the first Uruk settlements were established along the Middle Euphrates. These settlements soon formed part of a highly complex regional network that provided both the stage and means for intercultural exchange. Unfortunately, layers from this crucial period have not yet been found at Oylum Höyük. Instead, layers dating only from very end of this period (LCH 3) were excavated in the lower step of the eastern step trench. They provide us with a snapshot of material culture illustrating the different tracks of cultural development at work at Oylum toward the end of the 4th millennium.

Round hearths with a central depression were used at Oylum and certainly belong to a widely attested Anatolian local tradition. This form of hearths is well-known from other LCH or EBA sites in southeastern Turkey, such as Sos Höyük (Sagona 2000: pl. 3),

Norşuntepe (Hauptmann 1976: pl. 39, 31-32; 1982: pl. 17, 11. 18 pl. 12, 14. 16. 30-32; Gülçur 2000: fig. 5), Tepecik (Esin 1982: pl. 55, 51. 57, 52), Arslantepe (Palmieri 1981: 110), Judaidah (Braidwood and Braidwood 1960: fig. 260-261) and others. On the other hand, the pottery shapes clearly show connections with types from the Uruk sites on the Middle Euphrates, most characteristically droop spout bottles, nose lugged jars, conical bowls and other Uruk standard shapes. The manufacturing technique is, however, strongly rooted in the earlier LCH tradition, with heavily chaff tempered fabrics and brushes used to smooth the interior of the vessels. Such an admixture of handicraft traditions has previously been described as a hybridization process (Helwing 1999; in press) that may occur when locally trained potters start to produce the shapes of a different tradition. The Oylum Höyük assemblage is the perfect expression of such a hybridization process. With regards to the wide Uruk-related world, Oylum Höyük represents a community that must have been in close contact with Uruk sites on the banks of the Euphrates and that tried to integrate the new and unfamiliar styles observed there into its own cultural assemblage.

The transition from LCH to EBA in southeastern Anatolia and northern Syria is characterized by several dramatic changes. The Uruk sites on the Euphrates were abandoned. Most Syro-Anatolian sites underwent drastic changes in settlement layout and architectural design. Large tripartite houses, typical for both Uruk and Syro-Anatolian sites, were now replaced by smaller one- or two-roomed houses. Suddenly, large cemeteries with cist graves, chamber tombs and pithos graves, with plentiful evidence of complex burial rituals appear. Grave goods indicate a strong emphasis on status, and communal feasting seems to have been part of the burial rites, judging by the enormous quantities of pottery vessels in the tombs. It is only in the development of pottery traditions that strong continuity from the Uruk period can be seen. Pre-existing vessel forms continue to be used, as do certain decoration techniques, such as reserved slip.

Vast cemeteries of the early EBA, like those found throughout the Euphrates Valley[2], must have existed at Oylum Höyük as well. Unfortunately, in the excavated area at Oylum Höyük these tombs were destroyed by slope erosion and only the stone slabs from their walls and roof were found in slope debris. Metal objects that must have been items of personal adornment have been found out of context across the settlement.

These burial traditions continued at Oylum until the very end of EBA 4. Most outstanding are the chamber EBA 4 tombs that place Oylum Höyük in the same league as other sites where so-called "hypogee" have been found[3]. Single tombs are usually present in

[2] The best example for prestigious burials during EBA 1 is a richly furnished kurgan tomb recently uncovered in Arslantepe (Frangipane 1998); a less wealthy, but still extraordinary tomb was found in the settlement of Hassek Höyük (Behm-Blancke 1984); a contemporary graveyard with pithos graves was located west of the settlement; cist graves, chamber tombs and installations apparently related to the burial cult been recently discovered close to Birecik (Sertok and Ergeç 1999).

[3] The "hypogee" from Til Barsib is the classic example of such a chamber tomb (Thureau-Dangin and Dunand 1936); chamber tombs are also known from Umm al-Mara (Rice 2000), Jerablus-Tahtani (Peltenburg et al. 1996), Gre Virike (Ökse and Bucak 2001; 2002), Lidar Höyük and Titriş Höyük (Hauptmann 1997; comp. Carter and Parker 1995).

their immediate vicinity. This is also the case at most other sites where the chamber tombs form part of larger graveyards (Lidar Höyük; Titriş Höyük; Jerablus Tahtani; Belkis; Karkamish; Gre Virike). Looking further west, comparable graveyards are also known from the Islahiye area, such as Gedikli Höyük and Tilmen Höyük (Alkım and Alkım 1966).

Recently, meticulous excavations at Gre Virike (Ökse and Bucak 2001; 2002) have shed new light on burial customs in the EBA 3-4 period. Here chamber tombs formed part of a larger building complex, with small rooms that served for cooking, libations, and probably small offerings being connected to a chamber tomb. A canal system transported water from a basin on the summit, and an underground well also provided water. Apparently, the site was never used as a settlement during the EBA, instead it was entirely devoted to funerary cult. It may even been that the site served as a central funerary monument for neighbouring sites.

With the Gre Virike example in mind, the enigmatic small installations observed between the chamber tombs at Oylum Höyük can now be understood much better. As at Gre Virike, pebble platforms, small huts and cooking places may have served ritual purposes within the funerary context. More examples for this tradition can now be put into a similar context, such as the installations between graves present at the cemetery in Belkis, although not properly observed there (Sertok and Ergeç 1999). Another example of an EBA funerary monument is the "White Monument" at Tell Banat (McClellan 1998; 1999), a massive mudbrick cone that yielded many EBA tombs and that must have been visible from a distance as a central monument.

A closer look at the pottery assemblage from EBA 2-4 Oylum Höyük, characterized as it is by plain simple ware and gray-black spiral burnished vessel, with corrugated beakers, footed goblets, Syrian bottles and the similar, reveals strong links to the east, especially to sites along the Euphrates and on its western bord, above all Ebla II (Mazzoni 1982), but also Jerablus Tahtani (Peltenburg 1999a; 1999b), Tell Hadidi (Dornemann 1979; 1988) and many others. Interestingly, links to the west of Syria are much less visible: the assemblages from Tell Judeideh (Braidwood and Braidwood 1960), and Gedikli Höyük (Alkım and Alkım 1966; Alkım 1968) provide fewer comparisons, and brittle orange ware (Braidwood and Braidwood 1960), a fabric most characteristic of the Islahiye area is completely lacking around Oylum Höyük. This indicates that EBA Oylum was well integrated into an extensive *koiné* oriented towards the Euphrates, while relations to the western neighbouring Islahiye-Maraş Plain were less well developed.

This eastward orientation of Oylum Höyük shifted considerably during the MBA. Oylum was abandoned during the earlier part of MBA and was only resettled during MBA 2. This is in line with many other sites in Northern Syria that experienced a hiatus in occupation following the EBA. With the reoccupation of abandoned sites during the later part of MBA, settlements along the Levantine littoral gained a new importance as bases for steadily increasing sea trade. Northern Syria had become an integrated part of a trade network that connected to the Mediterranean and the Levant.

The large MBA building complex excavated on the eastern slope, with its distinctive trimmed basalt thresholds and large storage facilities, provides good evidence for increased

prosperity related to an intensification of trade. There are good comparisons to this building at other 2nd mill. BC centres in the surrounding area – e.g. at Alalakh and at Tilmen Höyük, where similar buildings constructed partly from trimmed basalt slabs were considered to be residences of local rulers.

The MBA 2 material found at Oylum Höyük clearly proves this new cultural and economic affiliation with the South and West. Finely carved bone inlays and small containers, frit beads, and occasional fragments of Tell al-Jahudiye ware are good indicators of Levantine trade relations. They occur alongside a distinctive Syrian pottery assemblage that can best be compared to Tell Mardikh IIIB (Matthiae 1980) and phase 5 of the well-stratified Lidar Höyük MBA material (Kaschau 1999) with plain simple ware, Amuq-Cilician painted and the characteristic Alalakh VII black/gray wares (Heinz 1992), Syrian style seals and terracotta figurines of west Syrian type.

One good example of a Syrian-style cylinder seal was found in the mass grave. It was carefully crafted from hematite with a kneeling hero flanked by two adorants as the main scene, and a standing bull below two birds as the minor scene. This seal belongs to a group of Syrian-style seals that are characterized by an "Akkadian renaissance" (Otto 2000) and the mingling of Egyptian or Egyptianizing elements (Teissier 1996) that occurs especially around Yamhad.

The small limestone relief found on the upper level of the street shows a winged god marching towards the right, carrying an axe over his shoulder and a dagger tucked into his belt. A second symbol, of a mace, shown behind the figure clearly indicates a warrior god, most probably Reshef, the male counterpart of the warrior godess Anat/Ishtar. The best comparison for this relief is a small terracotta plaque from temple P2 in Ebla (Pinnock 1995).

Mediterranean-Levantine trade intensified further during the LBA, and Oylum Höyük continued to be part of a larger, southwest oriented network. Excavated evidence is still limited, but the plentiful inventory of LBA objects points to strong western preferences. The local assemblage was enriched by local imitations of Mycenean table ware and other exotic items. Egyptianizing scarabs, Mittani common style seals and Hittite stamp seals occur within the same layers, symbols of all three power blocks gravitating around Oylum.

After the collapse of the Hittite Empire, the early Iron Age brought the fission of the imperial administration and the formation of smaller regional units of Neo-Hittite and Aramean kingdoms as their successors, eg. at Samal-Zincirli, Sakçagözü and Karatepe. Mostly, these new kingdoms were established at previously unoccupied locations, and only few places have continuity of settlement from the preceding period. Among the latter is Karkamish, where the dynasty established by the Hittites continued, to re-emerge a century later as the Great Kings of Malatya (Hawkins 1988). Oylum was continuously settled into the early Iron Age as well, but the exposed area is still too small to draw any further conclusions.

The southwestern orientation of Oylum Höyük shifted once again during the 9th-7th cent. BC., when the military campaigns of the Assyrian kings extended to the Mediterranean. There can be no doubt that these campaigns affected Oylum Höyük as well as nearby Azaaz, a town mentioned in the records of Ashurnasirpal II and conquered by Shalmanesar III (Klengel 1992: 194-196). Oylum Höyük has not been identified with a historical place yet.

Neo-Assyrian material, however, forms part of the material excavated on the northeastern summit, with Neo-Assyrian seals and the characteristic red burnished pottery of the middle Iron Age.

The following centuries brought first the integration of Northern Syria into the Achaemenid Empire in 539, and then the conquest of that empire by Alexander the Great. These events certainly had an impact on the settlement at Oylum Höyük, but the excavated buildings cannot yet be properly correlated to them, and the local material culture of these periods is so far not well understood. An enlargement of the excavations on the western summit, where a large building of Achaemenid or Hellenistic date has been uncovered, will hopefully further the understanding of these events in the future. Given the monumental scale of the building on the summit, it certainly belonged to a site of some importance. However, it is not yet clear that Oylum kept its place as the paramount regional centre in this period. The newly established settlement of Cyrrhus, about 15 km to the west of Oylum, as the crow flies, may have replaced it as a centre in the Hellenistic Period. Following the Hellenistic Period, Oylum Höyük was abandoned as a settlement site and a new settlement was founded on the western bank of the Akpınar, while the mound served only as a burial ground in Late Antique-Early Byzantine times.

CONCLUSIONS

Seven seasons of joint Turkish-German excavations at Oylum Höyük have helped to clearly establish the importance of this strategically located settlement on the historical map of Northern Syria. A cultural sequence could be defined that now allows to trace the history of Oylum Höük over 5000 years during which the site functioned as the paramount centre of the Kilis plain, both dominating the plain and mediating relations between east and west. The borderland situation of the Kilis plain, at the transition from the plain to the mountains, and on the watershed between the Mediterranean and the Persian Gulf, seems to have largely predetermined the role of the site. Located between overlapping interest spheres between larger cultural and political units, Oylum represented a bone of contention that was alternatingly integrated into different cultural spheres and political alliances. A more detailed investigation of these shifting cultural affiliations throughout the millennia remains the major objective of future research at the site.

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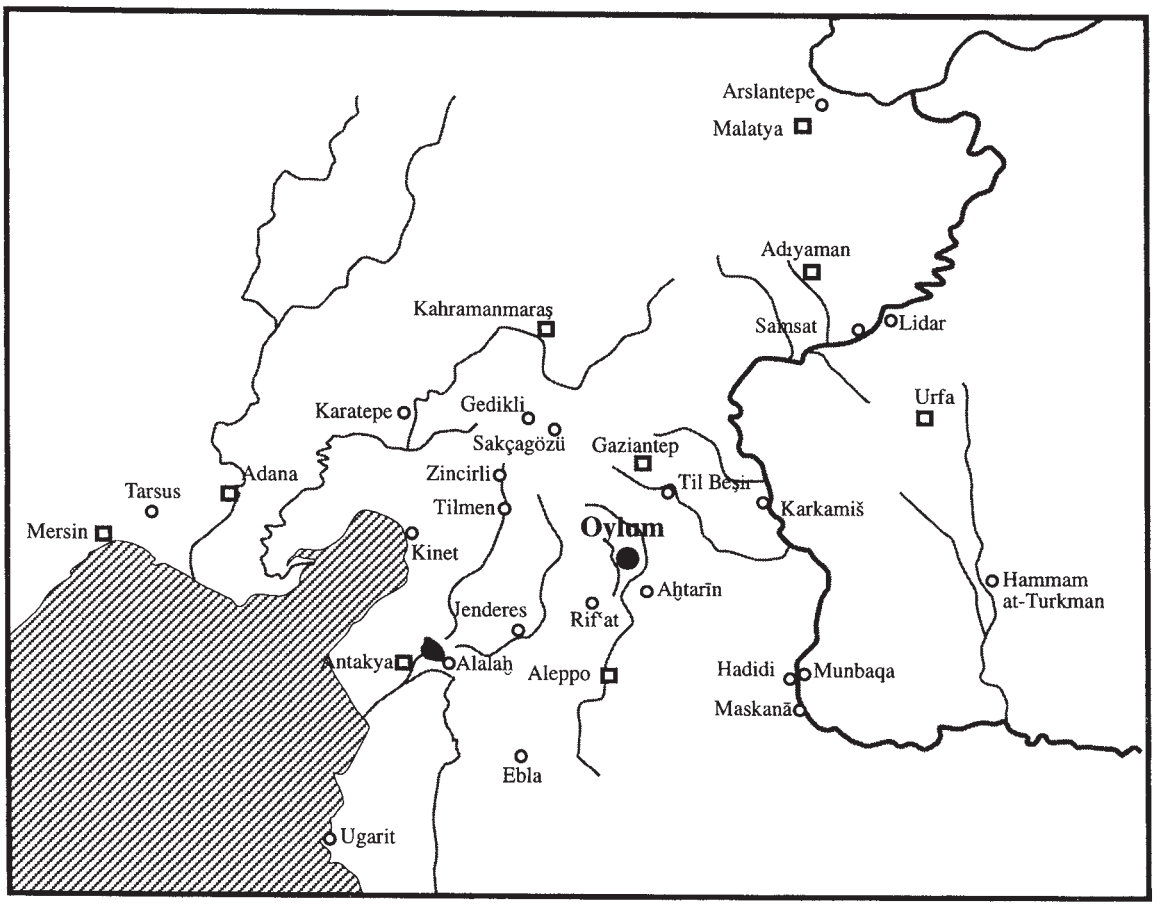

Figure 1. Map showing location of Oylum Höyük and of other sites mentioned in the text.

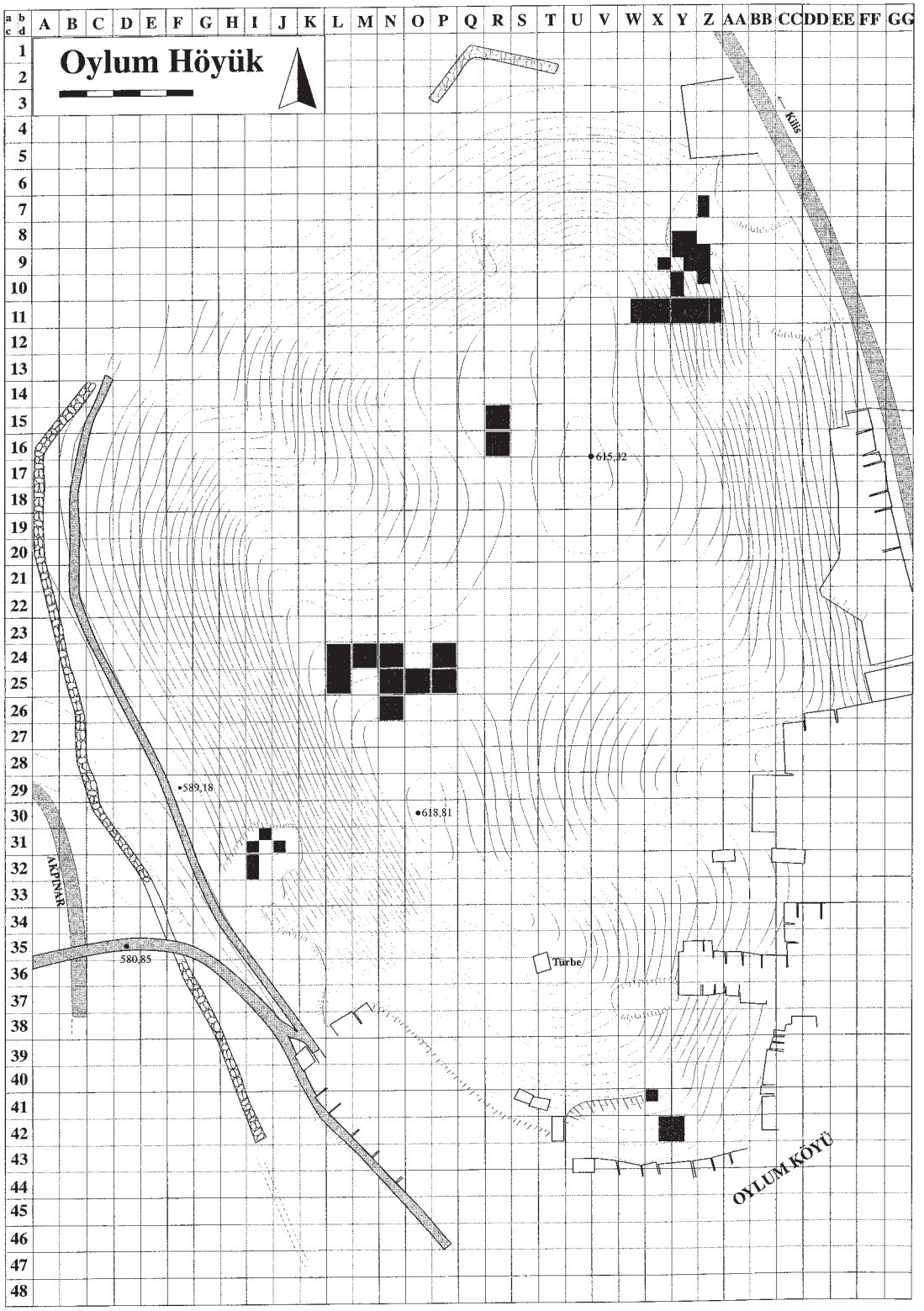

Figure 2. Oylum Höyük, topographic map and location of trenches.

Figure 3. Oylum Höyük, Western Terrace. Pithos tomb in shaft closed by mudbrick wall, LCH 2 (first half of 4th mill. BC)

Figure 4. Oylum Höyük, Western, Terrace. Red slipped pottery associated with the shaft tombs.

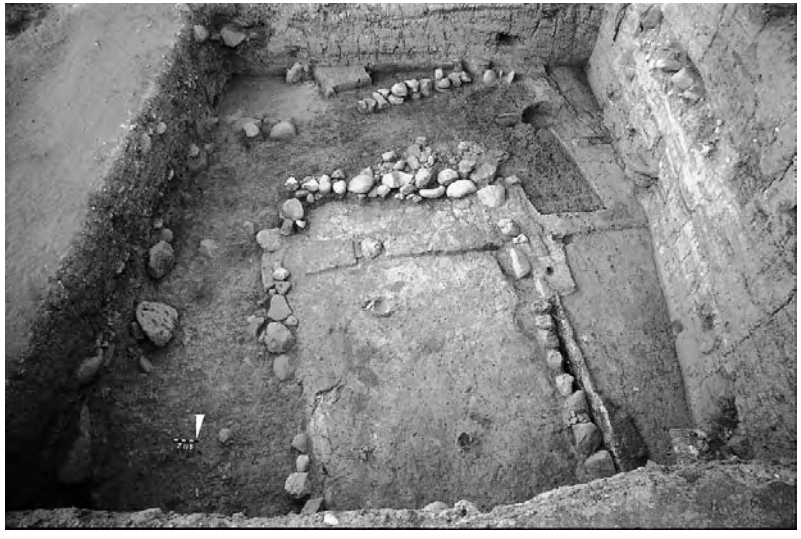

Figure 5. Oylum Höyük, Eastern Step Trench, square Z-AA11. Domestic building of the LCH 3 period (late 4th mill, BC.), lower building phase.

Figure 6. Oylum Höyük, Eastern Step Trench. Courtyard of MBA 2 building (2nd quarter of 2nd mill. BC)

Figure 7. Oylum Höyük, Eastern Step Trench. Cellar of MBA 2 building with crushed storage jars *in situ* (2nd quarter of 2nd mill. BC).

Figure 8. Oylum Höyük, Eastern Step Trench. Old Syrian Cylinder seal found in the MBA chamber burial 259.

Figure 9. Oylum Höyük, Eastern Step Trench, Lime stone relief, found in secondary position in the upper MBA building layer (2nd quarter of 2nd mill. BC)

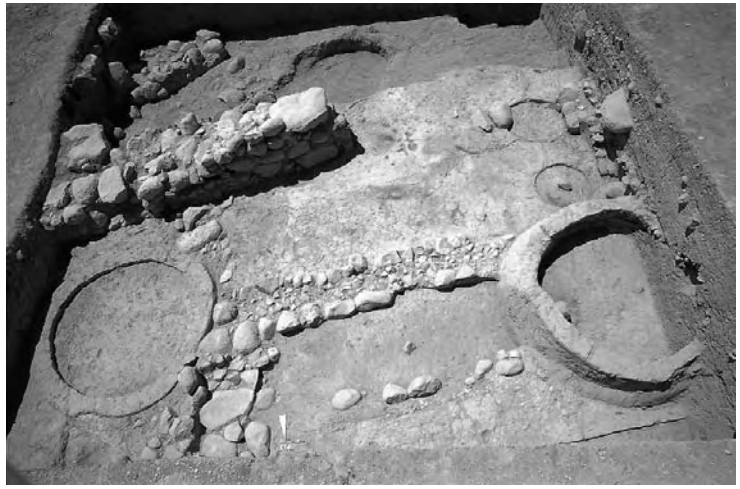

Figure 10. Southern Slope. Building of the LBA period (c. 3rd quarter of 2nd mill. BC)

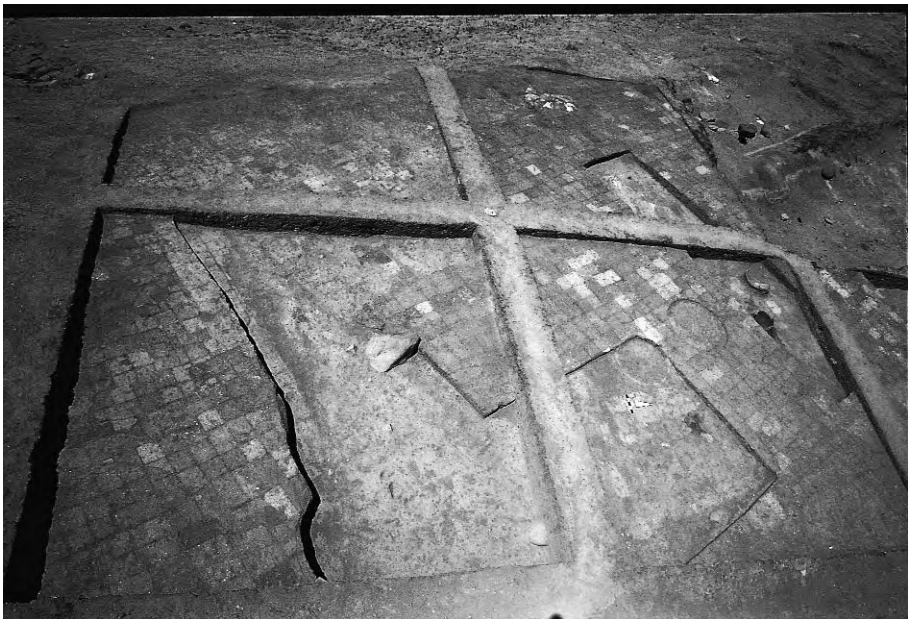

Figure 11. Oylum Höyük, Western summit. Hellenistic building.

Figure 12. Oylum Höyük, Field west of the mound.
Mosaic floor of a church, 5th-6th cent. A.D.

ANATOLICA XXIX, 2003

LES FOUILLES DU CIMETIÈRE DE GÖNDÜRLE HÖYÜK A HARMANÖREN

Mehmet Özsait[1]

Göndürle Höyük est situé à 27 km au nord-est d'Isparta, à 1 km environ à l'est de la village de Harmanören et de la pente méridionale du Tavşan Tepe, au lieu dit Tepecikaltı. Le cimetière, qui appartient au Göndürle Höyük et se trouve à 500 m au nord-ouest de celui-ci, s'étend au bas de la pente du Tavşan Tepe (Pl.I). Le cimetière a été découvert en 1989 lors des travaux effectués pour élargir la route secondaire (Tarla yolu), qui donne accès aux champs et qui est reliée à la route principale. Pendant ces travaux des pithoi sont apparus. Le musée d'Isparta est intervenu pour entreprendre des fouilles officielles, mettant ainsi fin aux fouilles clandestines. En 1993, nous avons été chargé d'un projet concernant la région des lacs (Özsait 1994: 29-41) et jusqu'à aujourd'hui, nous faisons des fouilles en collaboration avec le Musée d'Isparta grâce à une subvention de l'Université d'Istanbul et le Rectorat.[2]

Durant ces fouilles, que nous avions dirigé avec l'archéologue Nesrin Özsait, nous avons travaillé jusqu'à maintenant dans 23 tranchées (de A à U), où nous avons découvert 163 pithoi et un tombeau-caisse. Parmi ces pithoi, 93 ont livré des os et des squelettes. L'orientation principale des pithoi enterrés est ouest - est (fig. 1). Leurs orifices sont orientés à l'est, certains au nord-est, d'autres au sud-est. Cette orientation à l'est est probablement due aux croyances de la population. En outre, nous pensons qu'il existe une relation avec le lever du soleil qui varie selon les saisons : de juin à décembre. L'inhumation aurait été faite en fonction de l'orientation des rayons du soleil à son lever. Les orifices des pithoi sont bouchés de deux manières : soit avec une pierre placée à la verticale, soit à l'aide d'un autre pithos. Le corps du pithos est bloqué par un amas de pierres. A l'intérieur, les squelettes, qui, au niveau de l'épaule des pithoi sont placées dans la position du hocker, ont le crâne et le corps légèrement orienté à droite.

Concernant la première période de l'Age du Bronze Moyen (IIème millénaire avant J.C.), nous avons constaté que les squelettes sont placés sur le dos (comme dans les tombeaux F3, P10, R2), et dans la position du hocker (voir, F3: Özsait 1997:460; P10:

[1] Université d'Istanbul, Faculté des Lettres, Départemenrt d'Histoire et Civilisations Anciennes.

[2] Université d'Istanbul: Projets nos. 1618/30042001 et 2 / 27082002. Le Fond de Recherche nous a donné un appui efficace, permettant de réaliser chaque année un travail de grande ampleur. Ainsi je tiens à exprimer toute ma gratitude au Fonds de Recherche du Rectorat et au Décanat de la Faculté des Lettres qui ont assuré le financement de nos fouilles et des traveaux de prospections.

Özsait 2002: 330; R2: Özsait 2002: 330). En dehors d'objets personnels, comme un anneau ou des boucles d'oreilles, aucun objet n'a été trouvé à l'intérieur de ces pithoi. Ceci nous amène à croire qu'un changement de coutumes et de croyances eût lieu.

De temps à autre on constate la réutilisation d'un pithos : les restes de la première personne inhumée furent repoussé au fond pour faire place au nouveau défunt. Il arrive même qu'un pithos fût réutilisé une troisième fois selon le même procédé (Fig. 2). D'autres pithoi sont trouvés vides. Parmi ceux-ci certains contenaient les restes de bébés âgés de quelques mois. Pour les autres, l'absence de corps peut s'expliquer par une circonstance accidentelle, par exemple une noyade: la tombe entretiendrait donc le souvenir du défunt.

A cause de la nature du sol et de l'humidité, on n'a pu trouver de squelettes en bon état, même pas dans un tombeau intact. Malgré cela, nous avons pu observer que tous les morts sont couchés en position hocker. Les têtes sont posées près de l'orifice du pithos et regardent au nord. Certains tombeaux nous ont livré la calotte d'un seul crâne (A7: Özsait 1995: 155,fig.7; A12; R20: Özsait 2002: 332) le reste des os étant perdu (Fig. 3). Est-ce l'expression d'un culte? En général, les offrandes, qui accompagnent les défunts, sont fréquentes : allant de deux à plusieurs. La plupart sont déposées à l'intérieur des pithoi, quelquefois parmi un amas de pierre à l'extérieur. Jusqu'à présent nous n'avons pas l'impression que les objets trouvés en relation avec ces tombeaux reflètent des différences sociales entre les défunts. De toute évidence, les hommes de l'Age du Bronze utilisaient ces pithoi à l'usage quotidien pour y ensevelir leur morts.

Voici quelques renseignements à propos des tranchées et des tombeaux-pithos. Dans la tranchée K trois tombeaux-pithos furent mis à jour (Özsait 1998: 610 ff. Fig.13-22). Le tombeau K 3, qui était complet mais fêlé, avait été construit à l'aide de deux pithoi (Özsait 2002: 328). Son orifice avait été bouché par deux pierres de travertin verticales, maintenues par un amas de pierres. Il reste de grands fragments des épaules et d'autres parties du pithos qui avait été fermé pour protéger le défunt. Entre la bouche et l'épaule on voit quatre anses verticales. Le pithos a l'épaule large alors que sa panse se rétrécit vers la base. Le squelette, à l'intérieur en position hocker, avait la tête légèrement orientée à droite. Tous les os étaient *in situ*, mais le crâne gisait au niveau de l'épaule, face à la paroi du pithos. Au-dessous de la mâchoire il y avait une épingle, près de la poitrine du mort deux cruches à bec, et entre ses fémurs un rasoir (Fig. 4).[3] L'examen des os indique que le défunt était jeune et peut-être atteint d'une maladie d'os.

Dans la tranchée N on a mis à jour 13 tombeaux-pithos, parmi lesquels le tombeau N4 (Özsait 2000: 371-380). L'orifice était fermé par une grosse pierre plate. D'après la disposition des os nous avions constaté que ce pithos avait été utilisé trois fois. A

[3] Nous l'avons trouvé dans deux tombeaux à Harmanören: A 10 (Özsait 1995:155 f. Fig. 9) et K 3 (Özsait 2002: 328). La plus proche analogie se trouve à Semayük (Mellink 1967: Fig.16,17) et à Demircihöyük (Seeher 2000: 157, Pl. 41,G 350 d/f; 161, Pl. 45, G 421).

l'intérieur ont été trouvé un depas amphikypellon[4] (Fig. 5), une gourde ("matara", c'est à dire, céramique dont le corps ressemble à une gourde) avec son bec coupé (Fig. 6), cinq idoles en pierre[5] (Fig. 7), un "toggle pin" et deux épingles. A l'extérieur, au-dessus du cou du pithos ont été trouvé deux cruches à bec (Özsait 2000:372 f. Fig. 2-10).

Tranchée P: Lors de notre précédente fouille, nous avions constaté que les pithoi étaient proches les uns des autres. En général, l'installation de chaque nouveau pithos n'entraîna pas la destruction des précédents, mais dans la tranchée P des destructions ont eu lieu. En installant le pithos P 10, P 2 fut partiellement brisé, et en installant P 12, P 9 fut endommagé (Özsait 2002: 329).

Tombeau P 9: le pithos avait une bouche large avec quatre anses verticales symétriques. L'orifice était fermé par une pierre plate et mince contre laquelle une deuxième pierre plus épaisse était posée. Cette pierre provient d'une carrière: sur une face on remarque les traces du ciseau du tailleur. C'est un exemple important du travail de la pierre à l'Age du Bronze. P 9 avait été endommagé lors de l'installation de P 12. Il est cassé au bas du col. A l'installation de P 12 le squelette et les offrandes avaient été repoussés au fond. Parmi les débris éparpillés du squelette, on a trouvé une cruche à bec et un fragment de bec avec son cou montrant qu'il y avait deux offrandes dans ce pithos.

Tombeau P 12 : dans les fouilles d'Harmanören, c'est la première fois qu'on a trouvé un tombeau-caisse (Fig. 8). Lors de l'installation de P 12, P 9 avait été brisé et le squelette repoussé laissant le fond du pithos vide. Le sol en terre tassée à l'intérieur du tombeau-caisse atteignait le niveau du col du pithos (Özsait 2002: 330). Le tombeau P 12 avait été construit avec plusieurs grosses pierres formant une caisse rectangulaire, dont les parois sont maintenues à l'aide de gros fragments de poterie et de pierres. Après l'enterrement du défunt l'ensemble avait été recouvert d'assez gros blocs calcaires. A première vue nous avons cru à une catastrophe naturelle, notamment à un éboulement des pierres en provenance du Tavşan Tepe. En réalité cette construction est l'oeuvre des hommes, mais on ne s'explique pas pourquoi ils avaient choisi cette manière d'ensevelir le mort. Le crâne de celui-ci était orientée au sud-est et tournée légèrement à gauche. Le corps se trouvait en position hocker. A l'examen des os cette personne semblait âgée. Dans le tas de pierres á l'ouest, il y avait une petite cruche à bec et un petit pot.

Tombeau P 10 : ce tombeau est très important, car il nous donne une date. Pendant sa fabrication le corps du pithos avait été probablement entouré de bandes qui ont laissé

[4] Au point de vue de forme, la plus proche analogie de notre dépas sont les trouvailles de Troie II g et h; Troie III (Blegen 1951: Pl.67; Korfmann 1992: 22, Pl. 20). Aussi peut-on rapprocher certains exemplaires du Musée de Sadberg Hanım (Collection Hüseyin Kocabaş: Anlağan 1990: Pl. 59, Fig. 31), du Musée de Uşak (Hüryılmaz 1995: 182 f, Fig. 1,2; 437,Pl.7 b-c.), de Küllüoba (Efe-Efe 2001: 60, Pl. 4-a) et du dépas Karaoğlan. Il se trouve au Musée archéologique à Ankara (Env. No: K 940 348, 117 35).

[5] Nous pouvons trouver le plus proche exemplaire de nos idoles à Troie III et IV (Blegen 1951: Pl. 41, 48, 56 nr. 33-270. Aussi, il y a une ressemblance avec quelques sites: Kusura (Lamb 1938: 251,Fig. 17, 1-2); Semayük (Mellink 1967: Pl. 77,14,5); Beycesultan (Lloyd-Mellaart 1965: 32,4), Afrodisias (Joukowsky 1986: 595, 3; 599, 4; 600, 6), Demircihöyük-Sarıket (Seeher 2000: 146,Fig.30, a-d); de Kaklık (Efe-Ilaslı-Topba 1998: 78, Pl. 59, Fig. 174); Küllüoba (Efe-Efe 2001: 76, Fig. 28.)

des impressions en relief en forme de zones plates et des saillis (cordes) sur le pourtour du corps (Özsait 2002: 330). La forme et la technique de fabrication du pithos permettent de dater ce tombeau du début de la période du Bronze Moyen (Fig. 9).

Lors de la campagne 2001 nous avons travaillé dans les tranchées S (Pl. II) et T. Dans la tranché S nous avons mis à jour huit tombeaux-pithos et dans la tranchée T cinq . Ici, nous voulons donner quelques données sur les pithoi S7 et T5.

Tombeau S7 contenait un pithos de taille moyenne, détruit à cause de l'érosion naturelle. A l'origine il était intact et son orifice orienté au sud-est était bouché avec un bol en céramique, qui, à son intérieur, était marqué d'une croix rouge ("red-cross bowl"). Au-dessous du bord il y avait quatre tenons torsadés placés horizontalement (Fig. 10). Parmi les os éparpillés nous avons ramassé deux boucle d'oreilles en bronze. A l'intérieur du pithos T5 (tranchée T) gisaient deux squelettes dans la position hocker (Fig. 11).

Lors de la campagne 2002 les travaux se concentrèrent uniquement dans la tranchée U, (Pl.III).[6] Dans cette tranchée six tombeaux-pithos furent fouillés, dont trois avaient étaient déjà endommagés à l'Age du Bronze (U1, U3 et U5). Voici un résumé des données.

Tombeau U4 comprenait un pithos de grand taille qui était en même temps le seul intact de cette tranchée. Ce pithos, orienté est-ouest de l'orifice à la base, gisait sur une couche de petites pierres. Son orifice était fermée par une pierre plate, le corps et l'épaule maintenus par des pierres mêlées avec des fragments de poterie. A l'intérieur se trouvait les débris de trois squelettes, dont les deux premiers avaient été repoussés au fond pour faire place à l'inhumation du dernier. Trois cruches à bec, deux aiguilles et trois plaques en bronze gisaient au milieu des vestiges humains.

Tombeau U1 : lors de l'installation de U6, ce pithos avait été détruit et ses deux squelettes repoussés (Fig. 12). Dans le pithos U1, nous avons ramassé trois cruches à bec et un peson pour le tissage.

Tombeau U6 : ce petit pithos avait été installé dans le pithos U1 par les fossoyeurs qui avaient cassé la partie supérieure du celui-ci. L'orifice de ce pithos est orienté non pas à l'est mais au sud-est. Le corps du pithos est maintenu avec plusieurs grosses pierres. Il y avait le squelette d'un enfant à l'intérieur. On peut dater le pithos U6 au IIème millénaire avant J.C., c'est à dire au début de l'Age du Bronze Moyen.

Quatre causes de destruction de ces tombeaux-pithos ont été constatées. La première est l'érosion naturelle, qui a été active du fait que le cimetière se trouve au bas de la pente. La seconde est l'érosion anthropique, surtout due aux travaux agricoles. La troisième cause est la fouille clandestine, alors que la dernière concerne les dommages perpétrés à l'Age du Bronze, au temps de l'usage du cimetière. Par ailleurs, ces destructions nous ont aidé à découvrir les limites du cimetière, qui d'ouest en est s'étend sur 300

[6] Lors de la campagne 2002 notre équipe se composa de Nesrin Özsait (responsable des tranchées), Songül Alpaslan-Roodenberg (paléoanthropologue), H.I. Özsait-Kocabaş (architecte), et les chercheurs Hamdi Şahin, Özdemir Koçak, Adem Işik, Abdullah Dündar, Derya Çığır, Mustafa Bilgin, Evren Şar, Nihal Ozan et 12 étudiants. M. Mustafa Akaslan et M. Ferhat İnci représentaient le Musée d'İsparta. Je remercie sincèrement notre équipe, grâce à leur dévouement nous avons obtenu de bons resultats.

m. La limite nord est connue grâce à nos tranchées et nous pensons que le cimetiére s'étend dans la plaine à partir de cette limite jusqu'au Göndürle Höyük, où les couches correspondantes se trouvent à 5 m de profondeur. Dans les années prochaines nous voulons faire une fouille systématique à cet endroit.

Un certain nombre d'objets accompagnait les défunts. On y trouvait 71 cruches à bec (Fig. 13), 20 pots, une gourde (pour la plus proche analogie, voir Kamil 1982: Pl. 82,282; Efe 1988: Pl. 65, 1-2), un depas amphikypellon, des écuelles, tasses, pesons pour le tissage, des haches en pierre avec un trou d'emmanchement, des idoles en pierre ou en terre cuite, amulette en pierre, perles en pierre, "toggle pin", aiguilles-épingles (pour les types, voir Özsait 1995: 155,nt.6; Seeher 2000: 58, Pl. 16), des boucles d'oreilles, anneaux, anneau nasal, grattoirs (rasoirs?), un disque et des bracelets en bronze.

Jusqu'à l'année 1999 les squelettes humaines avaient été étudiés par le département de Paléoanthropologie de l'Université d'Ankara, par le Prof. Dr. Berna Alpagut et son collègue Insaf Gençtürk.[7] A partir de l'année 2002, cette étude à été reprise à Harmanören par paléoanthropoloque Dr. Songül Alpaslan-Roodenberg.[8]

Grâce aux fragments de poterie et aux offrandes telles que les cruches à bec ou les pots, le cimetière d'Harmanören offre les caractères généraux de la Région des Lacs, et reflète en même temps les particularités de la culture de Kusura – Yortan.

Mentionnons pour conclure que parmi nos trouvailles datant en particulier de la fin de l'Age du Bronze Ancien II au commencement du Bronze Ancien III, le depas amphikypellon et la gourde (matara) avec son bec coupé sont caractéristiques pour notre région. D'une pareille importance pour cette région sont les idoles à la tête en forme de disque, qui apparaissent en Anatolie occidentale et centrale dès le Bronze Ancien II. Comme nous l'avons dit, certaines trouvailles des dernières campagnes ont été datées du Bronze Moyen. Il en résulte que le cimetière était occupé jusqu'à cette période.

Après Semayük et Demirci Höyük, Göndürle Höyük et son cimetière offrent l'exemple le plus important d'un site de l'Age du Bronze anatolien. Il va sans dire que ce cimetière appartient au site de Göndürle Höyük, qui d'après notre prospection – durant laquelle des tessons du Chalcolithique Récent ont été trouvés ainsi que des tessons de l'époque romaine – a connu une longue période d'habitation. Outre les trouvailles du Bronze Ancien II et du Bronze Ancien III, le cimetière a livré des trouvailles datées du début de l'Age du Bronze Moyen. Or, pour les fouilles à venir nous avons bon espoir de trouver au cimetière des éléments des même périodes que nous avons repérés à la surface de Göndürle Höyük.

[7] Mes remerciements à Prof. Dr. Berna Alpagut et Ms. İnsaf Gençtürk qui ont examiné les squelettes de Harmanören.

[8] Je voudrais remercier très vivement le paléoanthropologue Dr. Songül Alpaslan-Roodenberg qui nous est venu en aide à Harmanören.

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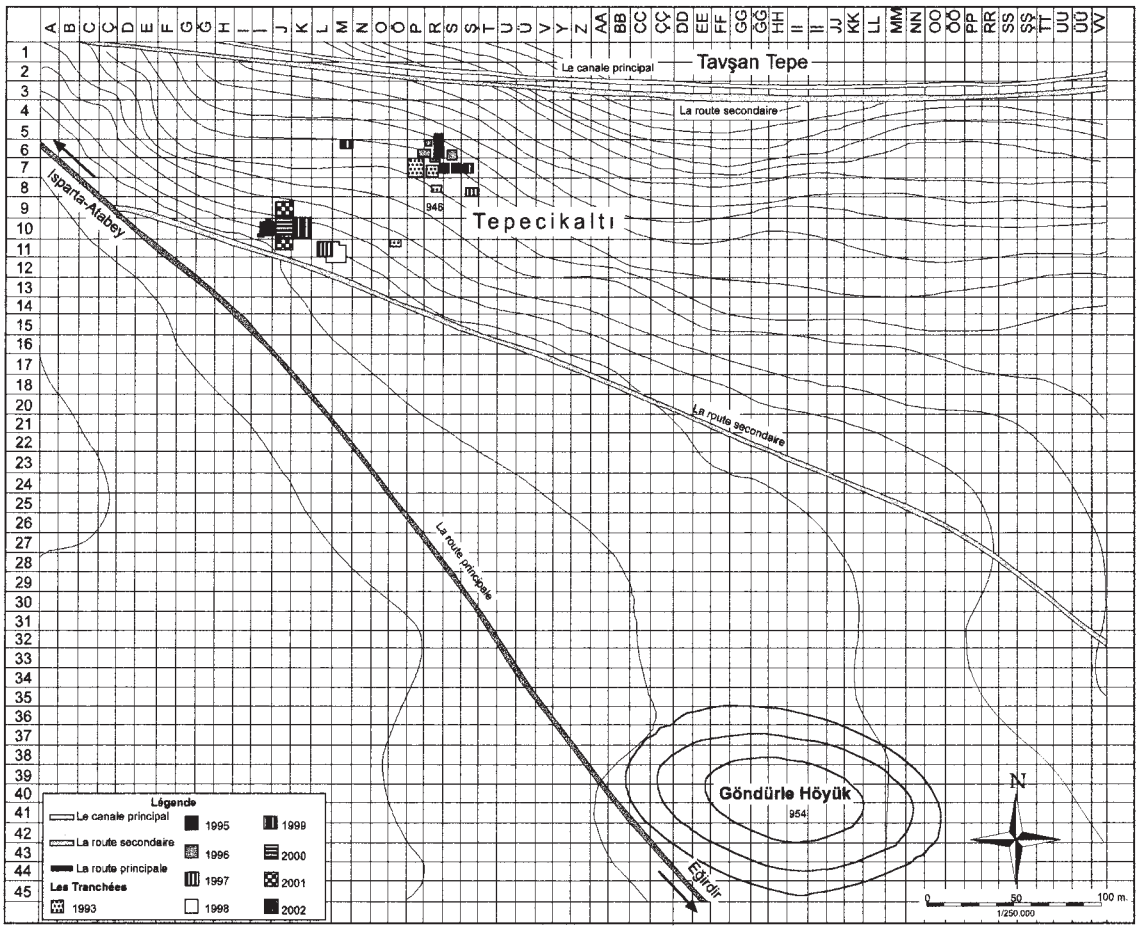
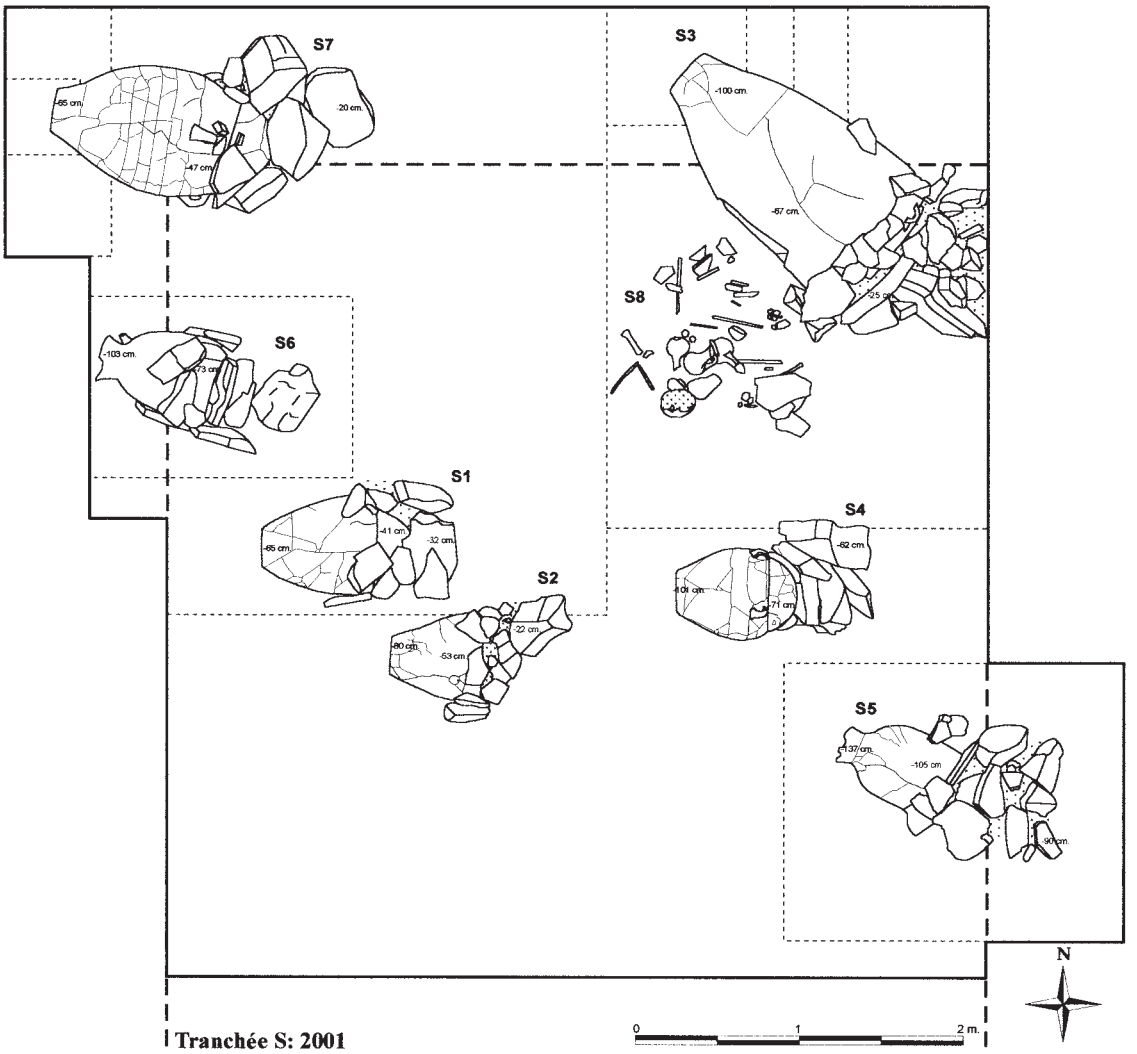


Plan Topographique du Cimetière de Göndürle Höyük à Harmanören.

Planche 1. Plan topographique



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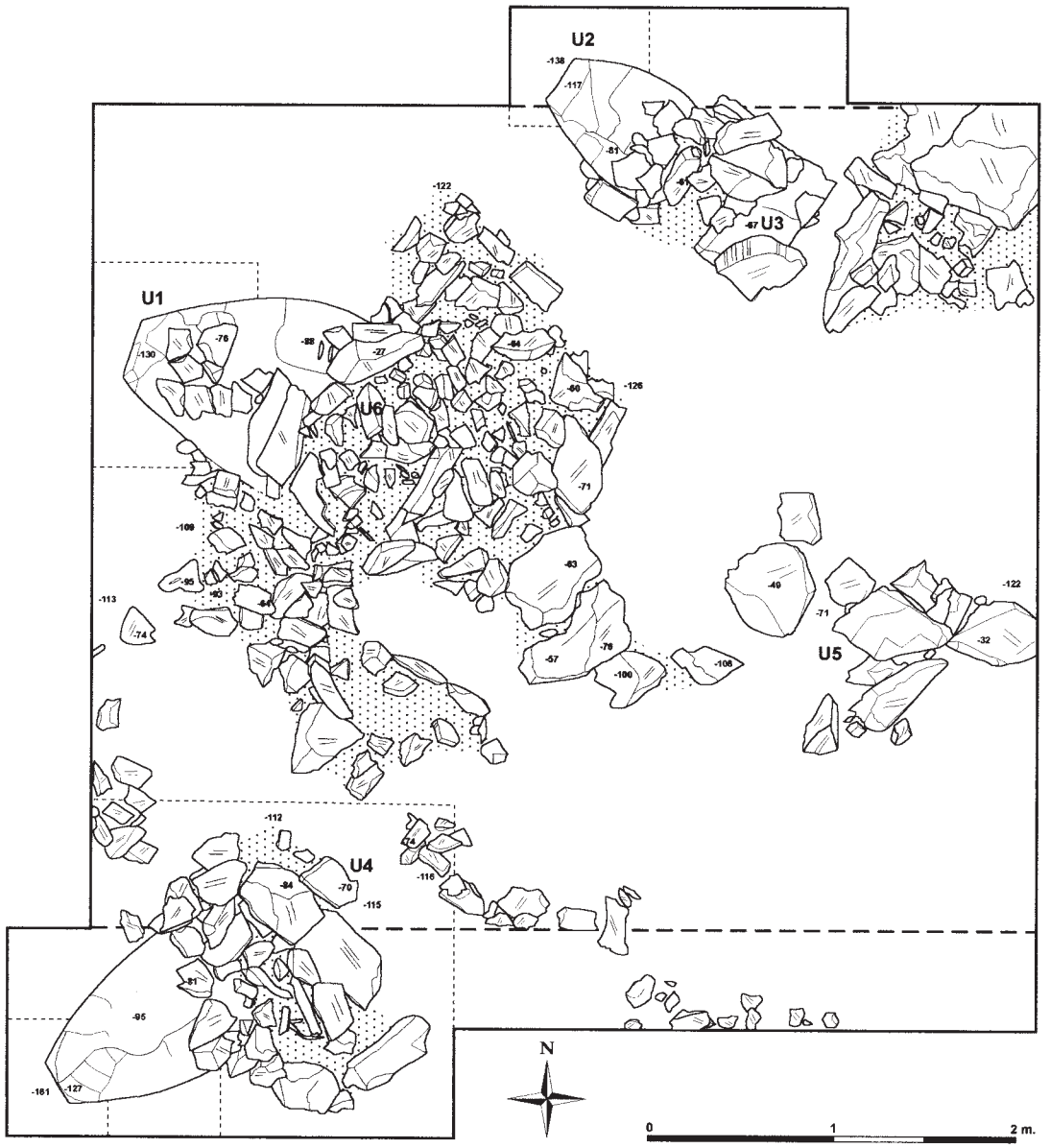

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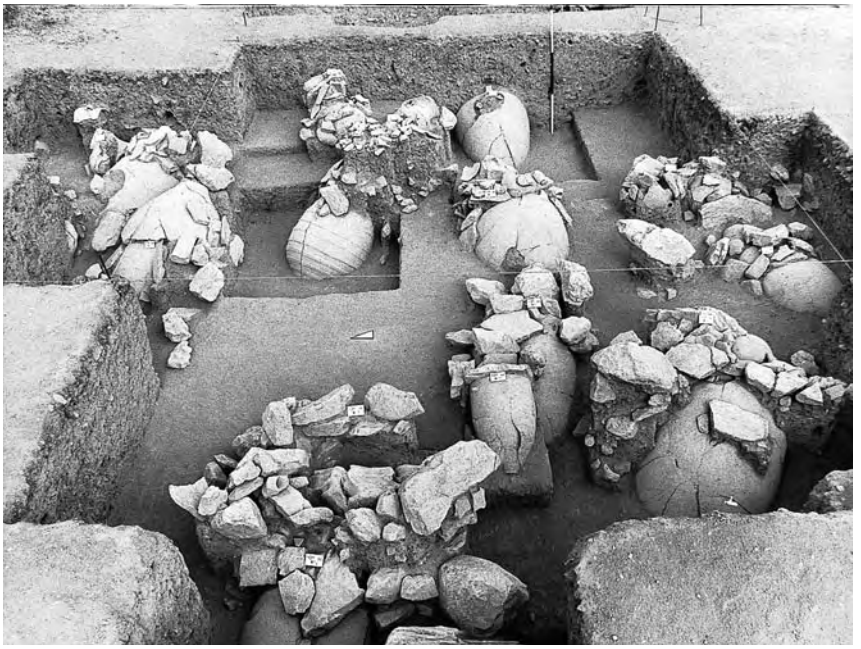

Figure 1. Tranchée R.

Figure 2. Tombeau R 9.

Figure 3. Tombeau R 20.

Figure 4. Tombeau K 3.

Figure 5. Depas amphikypellon (N 4).

Figure 6. Gourde (N 4).

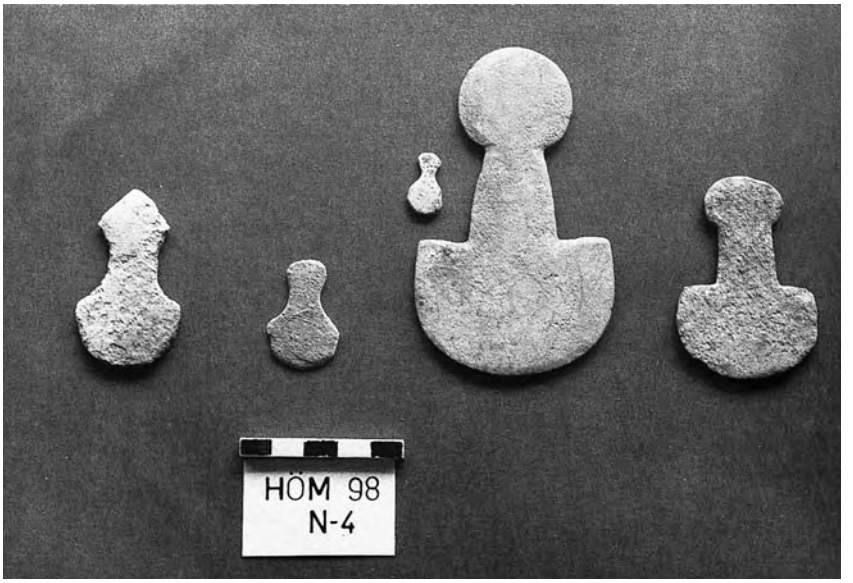

Figure 7. Idoles (N 4).

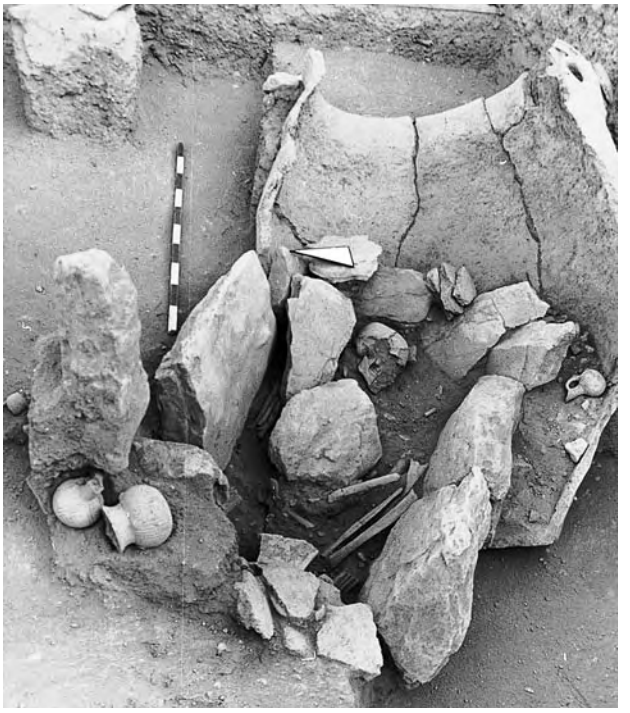

Figure 8. Tombeau P 12.

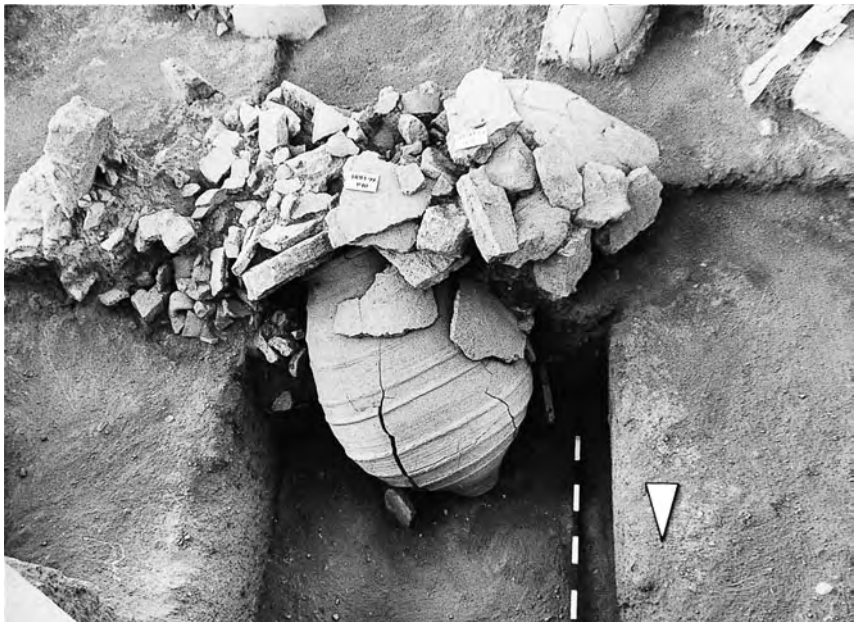

Figure 9. Tombeau P 10.

Figure 10. Tombeau S 7.

Figure 11. Tombeau T 5.

Figure 12. Tombeau U 1 et U 6.

Figure 13. Cruches à bec.

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THE UPPER TIGRIS ARCHAEOLOGICAL RESEARCH PROJECT (UTARP): a Preliminary Report from the 2001 Field Season[1]

Bradley J. Parker, Andrew Creekmore, Lynn Swartz Dodd, Cathryn Meegan, Eleanor Moseman, Richard Paine, Meg Abraham and Peter Cobb[2]

During the summer of 2001 members of the Upper Tigris Archaeological Research Project (UTARP) conducted a second season of archaeological excavations at the site of Kenan Tepe in Diyarbakır Province, southeastern Turkey (figure 1). Kenan Tepe is a large multi-period mound located on a natural terrace on the north bank of the Tigris River about twenty kilometers west of the Tigris-Batman confluence and ten kilometers east of the modern town of Bismil, just off the Diyarbakır to Batman highway (figure 2). During the course of the eight week field season, which took place between June 21st and August 24th, 2001, UTARP team members conducted various operations in seven areas of the site.[3] UTARP team members also positioned the site in the Universal Transverse Mercator

[1] This paper is dedicated to Dr. Toni Cross. We would like to give special thanks to Necdet İnal, the director of the Diyarbakır Museum, Latif Özer our Turkish government representative, and Numan Tuna, the director of TAÇDAM, for their valuable assistance to the UTARP project. UTARP's 2001 field season was conducted thanks to generous support provided by the National Geographic Society, the Office of the Vice President for Research at the University of Utah, the Curtiss T. and Mary G. Brennan Foundation, the University of Southern California, the University of Utah's Dee Council and the University of Utah's International Studies Center.

[2] Our team consisted of Bradley Parker (Director), Andrew Creekmore (Assistant Director), Richard Paine (Osteologist), Lynn Swartz Dodd (Ceramic Specialist), Chiara Cavallo (Zooarchaeologist), Cathryn Meegan (Archaeobotanical Specialist), Peter Cobb (Computer Specialist), Drew McGaraghan (Photographer/Artist), Michaelle Stikich (Videographer), Debbie Dilley (Field Lab Manager), Elvan Baştürk (Translator), Barış Uzel (Draftsman), Chris Moon, Dawnell Moon, Marco Baldi, Brian Bingham, Robert Sinnot, Jonathan Schnereger, Greer Rabiega, Eleanor Moseman, Kathryn Smith, Andrew Ugan, Amy Stevens and Sibel Torpil. Debbie Dilley and Kathryn Smith inked most of the drawings that appear in this article. Jonathan Schnereger was instrumental in preparing the metals, slags and ores for analysis.

[3] In Area A we continued excavation in the 2 by 25 meter step trench begun last year (trench A2) while a team of osteologists from the University of Utah opened a series of 2 by 10 meter trenches to explore the extent of Kenan Tepe's late period cemetery (A3-A7). We opened one new 10 by 10 meter trench in Area B (B4). In Area C we opened two new 10 by 10 meter trenches (C3 and C4) and continued excavation in two 5 by 5 meter trenches begun last year (C1 and C2). Trenches begun last year in Area D were expanded into two 5 by 10 meter units (D4 and D5). We also concentrated research on Area F where we completed the excavation of a 4 by 5 meter trench begun last year (F4), continued excavation in three of last year's 5 by 5 meters trenches (F1, F2 and F3), opened one new 10 by 10 meter trench (F7), one new 5 by 10 meter trench (F8), one 1 by 1 meter sounding (F10), and three section clearings (F6, F11 and F12). Additionally, we opened five 1 by 1 meter soundings in two new areas (Areas G and H).

(UTM) world grid, made a high-resolution topographic map, took nearly 2000 digital photographs, continued to develop a method of making trench maps using digital images, and improved our database, which now contains all of the data collected during the 2000 and 2001 field seasons. What follows is a preliminary report of research conducted during the 2001 field season.

GIS and Topographic Map

One of the goals of UTARP's 2001 field season was to conduct a high-resolution topographic survey of Kenan Tepe and to locate the surveyed area within the Universal Transverse Mercator (UTM) world grid. This survey is intended to aid researchers in examining Kenan Tepe in the larger context of both micro and macro analysis while at the same time creating a context within which to maintain three-dimensional control of finds, features and excavation units within the site.[4] To accomplish these goals, we laid out a network of five permanent survey points whose locations were measured using the Global Positioning System (GPS).[5] Our daily measurements were then tied into the overall grid with a Leica total station. The GPS system returns latitude and longitude polar coordinates at an elevation relative to a elliptical model of the Earth's surface called the World Geodetic System 1984 (WGS 84). The final results of our five measured points in latitude and longitude and UTM are as follows:

GPS:

	Latitude	Longitude	Elevation (WGS84)
TOP1A	37 49 50.11634 N	40 48 47.59917 E	603.724
NSIDE2C	37 49 51.83683 N	40 48 45.49863 E	594.364
SSIDE3T	37 49 47.66069 N	40 48 44.73145 E	580.590
RIVER4F	37 49 53.92375 N	40 48 55.04223 E	570.823
OFF5	37 49 39.27326 N	40 48 43.25381 E	601.367

[4] During the year 2000 off-season, at least one of our cemented iron datums disappeared, presumably pillaged for scrap metal. To avoid loosing our GPS survey points, we used PVC pipes measuring 2.5 by 100 cm in place of metal rods. These pipes were drilled at 5 cm intervals and long nails were inserted through the holes. The pipes were then cemented in a bed of stones leaving about 1 cm of the PVC pipe protruding above ground surface. The protruding plastic cylinder had the added advantage of providing a precise point from which to take further measurements.

[5] To place Kenan Tepe on the Universal Transverse Mercator (UTM) world grid we rented a Trimble GPS system from the British Institute of Archaeology at Ankara. UTARP would like to thank Dr. Roger Matthews and the staff of the B.I.A.A. for their generosity in allowing us access to this equipment. In order to increase the accuracy of our measurements, we placed our survey points over a very wide area. One point was laid at the top of the mound (TOP1A), while three more were placed in the far corners of the site (NSIDE2C, SSIDE3T and RIVER4F). For extra perspective, we also laid in a point on the top of a distant ridge (OFF5). Using the Trimble GPS system, data is collected with two receivers placed over separate points for a period of one hour. Since there are no trees, mountains or buildings around the site to obstruct the horizon, we had plenty of time when at least five satellites were in view of both receivers. We thus recorded each pair of points over a period that totaled ten hours.

UTM (Zone 37):

	Northing	Easting	Elevation (WGS84)
TOP1A	4188567.553	659568.237	603.724
NSIDE2C	4188619.586	659515.855	594.364
SSIDE3T	4188490.501	659499.598	580.590
RIVER4F	4188688.443	659747.918	570.823
OFF5	4188231.275	659468.490	601.367

Once our datum points were tied into the UTM world grid, we then produced a high-resolution topographic map of the site using a Leica total station (figure 3). We experimented with different resolutions on various types of terrain and determined that it was most efficient to shoot points every 2-4 meters. The resulting map contains a total of 7731 points. In conducting the topographic survey we determined the following information: the total area of visible mounding at the site is approximately 6 hectares, the maximum extent of the site on its long axis is 350 meters, while at its widest point the site is about 225 meters across, the highest point on the main mound is 604.2 meters above the WGS84 datum, the elevation change from the modern level of the Tigris River to this highest point of the main mound is 56.3 meters and the highest point of the main mound is 32.9 meters above ground surface in Area F.

AREA SUMMARIES

Area A

Trench A1

In our report of the year 2000 field season (Parker et al. 2002a) we described the discovery of nine individual burials in a single 5 by 5 meter trench (trench A1, figure 3) at the top of Kenan Tepe's main mound. During the 2001 field season Professor Richard Paine (University of Utah) led a small team of osteologists in the exploration of this cemetery. To determine the extent of Kenan Tepe's cemetery, UTARP team members laid out a series of 2 by 10 meter trenches (trenches A3 through A7) radiating out from trench A1 (figure 3). These trenches were excavated to the level of the shallowest burials discovered in trench A1 (approximately 40cm below ground surface). Using this method, UTARP team members discovered a total of twenty-three burials in an area measuring approximately 80 square meters. The locations of individual burials were mapped as soon as the existence of burial pits or human remains were discovered. Ten burials were chosen for excavation. A complete analysis of these remains is ongoing. Our preliminary estimates suggest that the excavated area represents slightly less than 10% of the total cemetery which could be as large as 800 square meters.

Excavation based on probabilistic sampling would have provided a more statistically sound estimate of the total number of burials at Kenan Tepe. However, we made a conscious decision to sacrifice statistical analysis of cemetery size for the greater protecti-

on of the human remains. Since radiating trenches gave us continuous stratigraphic control, we could better anticipate the depths and locations of skeletons. This enabled us to identify burials with minimum exposure and to minimize damage to the bones. Nevertheless, if we assume that the current sample is representative, then the Kenan Tepe cemetery could include more than 100 skeletons. The biggest variable affecting this estimate is the decrease in burial density from east to west. This was evident in our east-west running trenches, but the excavations were not sufficient in extent to assess, with security, its impact on total cemetery size.

The summer 2001 excavations revealed excellent preservation of burials of all ages, including a high proportion of subadults. Age and sex markers are present and readable. Though a large percentage of bones have been broken, many are available for measurement and morphometric analyses.

We encountered two distinctive burial patterns in the Kenan Tepe cemetery. In the most prevalent the individuals are extended, with their feet to the east, and arms crossed over their chest or pelvis (figure 4). The occipital portion of the cranium is placed on a small stone or potsherd. These burials are found at different levels, between 40cm and 80cm below ground surface. This may reflect a tradition in which different burial depths are utilized for males, females, and children, or it may reflect multiple burial phases. In the second burial pattern individuals are interred in a stone lined burial chamber (figure 5). Orientation is less precise than among the extended burials.

At this point dating of the cemetery is still extremely problematic since none of the graves excavated thus far have contained grave goods. Nevertheless, the orientation and treatment of the extended burials supports the hypothesis that these burials date to the Islamic period. UTARP team members are currently seeking permission to export small fragments of bone for carbon-14 analysis.

Trench A2

Trench A2 is a 2 by 30 meter step trench located on the north slope of Kenan Tepe's main mound. The goal of this operation is to illuminate the stratigraphic sequence of the site by excavating this trench in several large steps from the top to the bottom of the main mound. To reach this goal, we laid trench A2 according to the natural slope of the tell, rather than the cardinal directions (figure 3). Trench A2 is thus far divided into three steps: Step 1 between the 0m and 5m markers, Step 2 between the 5m and 10m markers, and Step 3 between the 10m and 25m markers (this third step will eventually be further subdivided).

During the year 2000 field season, UTARP team members exposed a series of walls (L2006, L2010, L2036) [6] running roughly east-west through Step 1 of this trench (Parker et al. 2002a). These walls were abutted on the south by a series of cobblestone

[6] Archaeological features and contexts will be referred to in this article by their locus number, which is expressed by the letter "L" followed by a four digit number. On some occasions the locus number will be followed by a "+" which means that this context was excavated using more than one locus. Artifacts will be referred to by their find number which is expressed by the letters "KT" followed by a four digit number.

surfaces (L2009+). At the close of the 2000 season, we left an east-west oriented mud brick wall (L2042) *in situ*. We renamed this wall L2066 for the 2001 season. Contrary to our original hypothesis (Parker et al. 2002a, 2002b), we now believe that these remains date to the early second millennium B.C.

During the course of the 2001 excavation, we exposed the eastern edge of a well-preserved north-south running wall that was faced with plaster in the west baulk (L2056); this wall continues into the south baulk. L2056 was associated with a series of surfaces including a thin, hard-packed, charred surface (L2065) with a well-preserved lens used as a rest for a (cooking?) pot with a round base. Around the perimeter of this charred surface, we discovered fragments of a plaster surface (L2061) which was bonded to and served as a foundation for wall L2056. The plaster surface L2061 also served as the foundation for walls L2066 and L2067, which were bonded to each other. Directly below the charred surface (L2065) we uncovered a circle of heavily burned cobblestones (L2073) arranged in a circle directly beneath the position of the pot-rest lens (in L2065). The burned cobblestones were integrated with a ring of hard packed red mud brick-like matrix containing consistently dispersed bits of charcoal. An earlier hearth (L2093) was later excavated under and slightly south of hearth L2073.

The circular cobblestone and hard-packed red matrix hearth L2073 cut a well-preserved coarse red surface (L2063) that was in turn cut by a fragment of a coarse yellow surface (L2072) in the southeast corner of the trench. The join between L2063 and L2072 formed a smooth lip indicating that the two surfaces were contemporary. Mud brick wall L2084 underlying yellow surface L2072 remained pedestalled at the end of the 2001 season. The red surface (L2063) abutted a mud brick wall running roughly east-west (L2076) to the north of the hearth (L2068 + L2065); this abutment (L2076-2063) is preserved in both east and west baulks. The fill (L2078) below red surface L2063 produced a significant cache of lithics between the hearth L2073 and the east baulk. Underlying subsurface fill L2078 was a beaten earth surface L2081, which was cut by an ash pit L2091 in the SW corner as well as ring of pottery sherds (L2090); L2091 and L2090 were left *in situ*. Surface L2081 abuts three walls underlying L2078: north-south oriented mud brick wall L2089 adjacent to east baulk just north of L2090, east-west oriented mud brick wall L2087 abutting wall L2089 to the north; east-west oriented mud brick wall L2088 parallel to the north but not abutting wall L2087. Wall L2087 abuts wall L2076 to its north in a clean line. All of these new walls, as well as L2076 remain *in situ*.

To the north of wall L2076 was a system of ash pits (L2044, L2058) containing a toy ceramic wagon wheel or spindle whorl KT2438 (figure 16 T). Underlying these ash pits we found an impression of a straw or reed basket (L2085), resting on a beaten earth surface L2092 and associated with an ash surface (L2102/L2103). Underneath ash surface L2102/L2103 we found a plaster surface L2106 in the east which is bonded to the north face of wall L2076 and a mud brick pavement L2107 in the west founded on cobblestone wall fragment L2109. A wall fragment L2110 makes a corner with wall L2076.

At the 7-8m peg we excavated a series of poorly preserved surfaces (L2045, L2047, L2048). Alternating pink and grey-green mud brick bands (L2086) in the section at

the 7m marker never revealed brick lines in plan. Underlying this series of surfaces we found several fugitive ash lenses (L2095 and 2096) constituting a layer of ash-filled occupational debris above a surface (L2100) spread out all over the east half and into the west half of the 5m - 10m step. Surface L2100 had a flat-lying basalt doorpost resting on it at the east baulk. The baulk and section at the 8m marker showed lots of ash layers; these layers remain unexcavated. Below a layer of hard-packed soil (L2097), we exposed a pebble surface (L2098) that extends between the 9m and 10m markers. This pebble surface remains *in situ*.

Between the 12m and 25m markers we removed topsoil as L2043. We also excavated sub-topsoil as L2064 at the 16m, 17m, and 19m markers. We found one interesting feature at the 13m marker: a row of large cobbles terminating at the east with a large flagstone (L2055). We believe this may be the remnant of a wall foundation. The stones remain *in situ*.

Area B

During the year 2000 field season UTARP team members opened two 5 by 5 meter trenches in Area B (Parker et al. 2002a). Trench B1 yielded an impressive collapse layer (Parker 2002a) that contained a sizable corpus of Early Iron Age ceramics, some of which are presented here as figure 6. In order to achieve a wider exposure of this layer, we expanded trench B1 in 2001 into a 10 by 10 meter unit by opening an L-shaped unit (B4) bordering the original 5 by 5 meter trench on its north and east.

Trench B4

Our findings in B4 are characterized by two levels of stones scattered across the entire northern and eastern parts of the trench (L4008 and L4027). These stones, which overlay a soft ashy fill (L4025), do not appear to form a coherent structure or foundation course. Our working hypothesis is that the stones may have toppled from a once-coherent structure or large wall that lies at least partially outside the trench. A stone wall (L4014) was also discovered running roughly north-south across the northeastern quadrant of the trench. The relationship between this wall and the stone features discussed above has yet to be determined. A well preserved oven (L4013, L4017), securely dated by numerous examples of Early Iron Age corrugated ware, was discovered in the center of the trench, west of the stone features, resting on the same ashy fill (L4025).

Area C

During the year 2000 field season UTARP team members began two 5 by 5 meter trenches in Area C (trenches C1 and C2). Trench C2 initially produced architecture dated to the Early Iron Age by an abundance of Early Iron Age corrugated ceramics. These remains overlay mud brick walls, surfaces, and fills that contained remains of slag- and ash-producing activities. The lower levels of this trench are dated to the Middle Bronze

Age by ceramics belonging to the Red-Brown Wash Ware assemblage and by three carbon-14 dates (see below). Trench C1 also produced architecture dated by these ceramics (Parker et al. 2002a). These findings led us to open two new 10 by 10 meter trenches in Area C (trenches C3 and C4 [see figure 3]) and to continue work in the 5 by 5 meter trench C2 begun during the 2001 field season.

Trench C2

Excavation during the 2000 and 2001 field seasons revealed that trench C2 contains the northeastern corner of a large structure. This structure, whose walls were built on stone foundations, was rebuilt several times during the Middle Bronze Age. The structure abuts layers of outside surfaces that show clear evidence of fire-related activities. Pottery from the structure belongs to the "Red-Brown Wash Ware" assemblage dated to the early second millennium by three carbon-14 dates extracted from this trench (see below).

A thin mud brick wall (L2037, L2038, L2047) of two to three courses was uncovered during the year 2000 field season. The wall runs along the northeast baulk and turns south to traverse the trench. This wall forms a stratigraphic cap for a series of stone walls (L2048, L2046) and their associated surfaces (L2048, L2072, L2063, L2089) that represent rebuilding episodes for a multi-room structure(figure 7).

The stratigraphy of the rooms and outside surfaces outlined by these walls (L2048 and L2088) is as follows: both walls (L2048/L2072 and L2046/L2088) appear to have been founded on a surface (L2099). This surface runs under the stone wall foundation L2046/L2088 and has so far only been exposed in a small sounding created during clearance of a later pit. Surface L2089, to the east of wall foundation L2048/L2072, may be related to this structure. The fact that walls L2048/L2072 and L2046/L2088 were founded on the same surface suggests that they were in use at the same time. Subsequently surface L2095 built up to the south of and within wall L2046/L2088 so that it eventually covered the southern end of wall L2048/L2072. This suggests that the southern portion of that wall foundation fell out of use sometime during the life of the building. If the plaster line visible in the pit/fill feature L2096 can be related to the end of the large stone wall foundation (L2048/L2072), then that wall may have been originally plastered. Otherwise, the large stone wall (L2048/L2072) was cut by a pit (L2096) in which a clear plaster line is preserved, for reasons that remain to be determined, and then surface L2095 subsequently covered over this stone wall's (L2048/L2072) southern end.

A work area (L2079) was excavated south of the plaster line in L2096. This area showed evidence of fire related activities, including finds such as a clay andiron (KT2529), burned earth (KT2531), bluish crust on soil (KT2702), and metal or slag (KT2527). These may be related to metal processing activities.

In the central southern section of the trench, in an area bounded on its northern side by wall foundation L2046/L2088, UTARP team members excavated a dense accumulation of artifacts (pottery, ground basalt and bone). The surfaces associated with these walls include L2095 and L2099. A circular pit (L2084) cut into surface L2095. This pit contained, among other things (pottery, bone, lithics and slag), a carbon sample (KT2576) which

yielded a 2-sigma calibrated carbon-14 date of 1840 +/-100 B.C. (table 1). Pottery within this pit (L2084) included KT Type 28 "Red-Brown Wash Ware", KT Type 83 "Carinated Bowls", KT Type 120 "Flaring Lip Jars" and several examples of large neckless jars.[7] A second carbon sample (KT2614), yielding a date of 1810 +/-140 B.C., came from the fill (L2087) surrounding pit L2084 (table 1). Another sealed pit (L2082) was discovered within the structure. A carbon sample (KT2584) from this context yielded a 2-sigma calibrated date of 1800 +/-120 B.C. This pit and the surrounding loci contained more examples of ceramics from the Red-Brown Wash Ware corpus.

Table 1: Carbon 14 data from trench C2.

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 165446	3500 +/- 50 BP	-26.5 o/oo	3480 +/- 50 BP
SAMPLE : L2082 KT 2584			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT :	(charred material): acid/alkali/acid		
2 SIGMA CALIBRATION :	Cal BC 1920 to 1680 (Cal BP 3870 to 3630)		
Beta - 165447	3520 +/- 60 BP	-26.8 o/oo	3490 +/- 60 BP
SAMPLE : L2087 KT 2614			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT :	(charred material): acid/alkali/acid		
2 SIGMA CALIBRATION :	Cal BC 1950 to 1670 (Cal BP 3900 to 3620)		
Beta - 165448	3520 +/- 40 BP	-25.2 o/oo	3520 +/- 40 BP
SAMPLE : L2084 KT 2576			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT :	(charred material): acid/alkali/acid		
2 SIGMA CALIBRATION :	Cal BC 1940 to 1740 (Cal BP 3900 to 3690)		

Trench C3

This trench was excavated as two large units that roughly correspond to the eastern and western halves of the trench. The west half of the unit did not generate any significant architectural remains in part because of its proximity to the modern ground surface. There was, however, a fairly large bone cluster (L3010, [perhaps the remains of a butchering incident?]) in its southwestern corner. A north-south running row of stones (L3005) was not substantial enough to be considered a wall foundation, unless it was subsequently

[7] A preliminary report that includes a discussion of the Kenan Tepe ceramic typology of this period is currently in preparation.

robbed out. The northwestern quarter of the trench is characterized by a series of downward sloping (to the west) hard, silty earthen surfaces. An arc of mud brick (one brick thick at maximum [L3016]) was noted to the south side of these layers. To the north of these surfaces the remains of two clay ovens (L3006 and L3023) were discovered. Trench C2 is located north of these ovens and the associated levels were dug during the 2000 field season. The western area of the C3 trench, although not well understood, may have been a multi-use work area which included ovens and exterior surfaces open to drainage of rainwater or some other liquid effluent that compacted the built-up surfaces. These surfaces were bounded on their southern side by a thin mud brick feature that might have separated or shielded the space to the south from the wind or smoke from ovens.

In the eastern half of the trench there was a greater depth of soil covering the ancient, *in situ* materials. A clay tanoor type oven was located in the south east baulk of C3 (L3003, L3004 [contents], L3027 [associated surface]). North of this oven were a series of rocks groups that included the bottoms of large pots, ovens, or more generally, some sort of pyrotechnic installation (such as L3008 and L3009) containing rock conglomerate concretions (L3007). Two metal pieces KT3045 and KT3046 were found in this area. Below these features in the east portion of the trench is a rectangular mud brick feature (L3030) that seems to have contained an oven or an area in which burning of some sort occurred (L3031 and L3058). The area bounded by the low mud brick structure contained ash, plaster lenses, carbon and other debris. A substantial stone wall foundation (L3037) that traverses the entire 10 by 10 meter unit was discovered below the mud brick feature L3030. This wall foundation is more than ten meters long and is about one meter wide. The fact that a crossing wall was not discovered in trench C2 during the 2000 season indicates either that the wall is more than 15 meters long and turns west between trenches C2 and C4 or that the wall turns east and runs into an uphill structure. If the structure is located uphill, to the east of C3, then it will probably be fairly well-preserved by covering soil, and may have been excavated in part in Area B.

Trench C4

As with trench C3, Trench C4 is more deeply excavated on its eastern uphill side. The proximity of loci excavated in the western half of the trench to ground surface means that preservation in this part of the unit is fairly poor. Until the structure (L4030, L4041 and L4058) was reached, the finds in C4 consisted of two types: (1) a series of poorly coordinated artifact groups (such as L4015, L4016, L4017, L4018 and L4049 among others) with no stratigraphic continuity between them. These artifact groups are similar to those also noted in trenches C1 and C3 and often show signs of burning. In the case of L4049, there appear to be pot sherds "melted" into a possible concretion. (2) The second sort of find includes ovens such as L4031. The only substantial architecture identified is a mud brick structure comprised of three walls: a SW-NE running wall (L4030) which is bounded on its north end by a crossing wall (L4041) that runs W/SW, and another wall (L4058) which is parallel to L4041 and meets wall L4030 at the south baulk. L4058 is poorly preserved and fragmentary. To the west of wall L4030, a surface (L4061) with large

amounts of Early Iron Age pottery appears to be associated with the wall. The surface is located at the point where the wall has apparently been cut by pit L4047.

Three interesting artifacts were discovered in Trench C4: A ceramic scepter or finial, or door-closing knob (KT4168 L4033), and two round stone weights or tokens (KT4075 L4010 and KT4231 L4026).

Area D

During the year 2000 field season UTARP team members opened two 5 by 5 meter trenches (D1 and D2) and one 2 by 2 meter sounding (D3) on a small protrusion on the steep eastern slope of Kenan Tepe's main mound (Parker et al. 2002a [see figure 3]). During the 2001 field season the two 5 by 5 meter trenches (D1 and D2) were combined into one 5 by 10 meter trench (renamed D5). In addition, the 2 by 2 meter sounding (D3) was expanded into a 5 by 10 meter trench (renamed D4). Analysis of the remains excavated in trench D5 is still ongoing. For this reason this report will concentrate on trench D4.

Trench D4

During the year 2000 field season UTARP team members began a 2 by 2 meter sounding east and upslope from our other Area D trenches. This sounding immediately yielded extraordinarily well preserved wall foundations and associated surfaces. These finds prompted us to expand this excavation unit into a 5 by 10 meter trench during the 2001 field season. This operation yielded well preserved architecture and large amounts of ceramics belonging to the Red-Brown Wash Ware assemblage (figures 9 and 10). Carbon-14 samples taken from contexts yielding identical ceramics in trench C2 show that this assemblage and its associated architecture dates to the early second millennium B.C. (see above).

After clearing the topsoil and sub-topsoil we immediately came upon a surface (L4012+) that covered nearly the entire southern two-thirds of the trench. This and the succeeding surfaces were cut in the north by a large pit (L4028+) that contained a number of well-preserved whole mud bricks and other debris. Two more surfaces (L4023+ and L4030+) were discovered directly beneath and sealed by surface L4012+.Surface L4023+ also extended across the majority of the trench although the eastern portion, which, due to the slope in the mound, came very close to ground surface, was separated to ensure that no intrusive material contaminated this otherwise sealed context.

The removal of surface L4023+ revealed an interesting set of architectural features (figure 10). To begin with, this level was divided laterally by a narrow wall (L4038) made up of a single course of stones. The floor on the east (L4030+) was clearly bonded to this wall and contained an extraordinary set of ceramics crushed in to the matrix of the floor (figure 9). Three features were bonded to the east side of wall L4038. The first is a surface or pavement consisting of very large stones (L4037). Bordering this feature on the north was a single course of mud bricks (L4035) forming a wall perpendicular to wall L4038. These bricks were roughly square measuring approximately 40 by 40cm. North of and

bonded to wall L4035 was a narrow pavement of upstanding river cobbles (L4040). The pavement is approximately 0.65cm wide (north-south) and extends for 1.4m east-west before entering the east baulk of the trench. An area of fill (L4039) directly north of the cobble surface (L4040) yielded another assemblage of ceramics. Removal of fill L4039 revealed a stone feature (L4043) that appears to be the foundation of another wall. Wall L4043 runs east-west parallel to the upstanding cobble surface (L4040) and mud brick wall (L4035). This feature is cut on the east by the large pit (L4028+) mentioned above. Our working hypothesis is that this wall originally joined wall L4038 and the wall discovered in the sounding (D3) excavated during the year 2000 field season. North of wall L4043, in the narrow corridor formed between the east baulk of the trench and the baulk left around the original sounding (trench D3), we uncovered a fill layer rich in ceramics and containing two small pits (L4033 and L4044) one of which (L4033) yielded a slag sample (KT 4157 see below).

A third surface (L4041+) was discovered sealed beneath floor L4030+ and wall L4035. Again this surface yielded large amounts of ceramics that were pressed into the hard matrix of the locus. Removal of wall L4035 revealed that this wall rested on top of surface L4041+ and that surface L4041+ was bonded to the large stone pavement (L4037), the mud brick wall (L4035) and the upstanding cobble pavement (L4040).

The nature of the deposits in trench D4 suggests that all of these remains belong to a single large structure. The series of floors L4030+ are probably the remains of inside surfaces indicating that the east outside wall of this structure has been lost to erosion. The fact that wall L4038 stood on top of the last floor levels within this structure (L4040+) suggests that this was a dividing wall rather than a load-bearing wall. In contrast, wall L4035 appears to be a structural feature that marks the divide between the hallway (L4040) and the boulder surface (L4037). We can be less certain about the stratigraphic relationship between these features and the pits discovered in the northwestern corner of the trench, although the ceramics recovered in both areas indicate that these pits certainly belong to the same general period as the building discussed above.

Area F

Area F is located northeast of the main mound on a flat terrace approximately 23 meters above the Tigris River (figure 11). During the 2001 field season UTARP team members opened two new trenches (F7 [10 by 10 meters] and F8 [5 by 10 meters]) and continued work on four existing trenches (F1, F2, F4, and F9 [formerly F3]).

For ease of discussion, we have organized our excavated contexts in Area F into seven levels. These levels generally correspond to contemporaneous stratigraphic layers, but since we have yet to fully connect many of these layers horizontally or by chronometric dating, we must emphasize that the current grouping is tentative and may change in subsequent reports. Level one consists of numerous burials cutting earlier contexts. These burials are difficult to date and may range anywhere from the Early Bronze Age to the

Islamic Period. Levels two through seven are tentatively dated to the late fourth and early third millennium by five carbon-14 dates and several diagnostic ceramic forms.

To give a firm date range at this time is premature, but we tentatively believe that levels two through seven fall between 3700 and 2500 B.C. The earliest deposits examined so far, just above virgin soil in an oven/kiln L4009/L4027 in trench F4, contain a variety of Late Chalcolithic ceramic forms (figure 12). Three carbon dates from the bottom of this oven/kiln yielded two sigma calibrated dates of 3360-3030 B.C. (KT4157), 3630-3570 B.C. and 3540-3360 B.C. (KT4229), and 3660-3620 B.C. and 3600-3520 B.C. (KT 4253 [table 2]). A carbon-14 date obtained during the 2000 season from the upper layers of ash and debris in the same oven/kiln yielded a two sigma-calibrated range of 3350 to 2910 B.C. (KT 4061 [table 2]). Late Chalcolithic vessel fragments found inside this feature and in other loci include a range of wheel-made indigenous forms familiar from adjacent regions, including simple-rim open cooking bowls (usually relatively large), incurved rim bowls (relatively small), a variety of hammerhead rim open bowls, cooking jars, squat carinated casseroles, and storage jars with bent necks (figure 12 and compare Algaze et al. 1990; Pearce 2000:117; Pollock and Coursey 1995). These forms are usually chaff tempered and not infrequently burnished. "Fineware" examples of bowls have also been identified, both in grit and chaff temper, often burnished. These various types have been recovered from trenches F1, F4, F5, F6, H1, and also F10 and G4.

The latest remains in Area F, excluding intrusive burials, are the level two cobblestone surfaces in F1, F2, F7, and F8 (and possibly F4). Numerous sherds of pedestalled bowls, alternatively called "chalice ware" (Spesier 1932:5-10) or "fruit stands," have been recovered on these surfaces and in the fill around them. These forms occur in the Chalcolithic, but not in the variety that we find at Kenan Tepe. The Kenan Tepe examples are chaff-faced fine wares, red slipped and vertically burnished (see "small finds" and figure 17 Y). These forms proliferate in the Ninevite V period (3100 – 2500 B.C. [Ay 2001:723; Rova 1988]). Pedestaled bowls and other Ninevite V forms, including 'beakers' and pierced lugs, have been found throughout Area F, but so far are concentrated in trenches F2, F7, F8 and F9.

Although we have not yet quantified the ceramics, and many contexts await analysis, our initial impression is that there are few, if any, classic Uruk types. Bevelled-rim bowls, conical and band-rim bowls, as well as double-mouthed jars are notably absent. No drooping spout vessels have been identified absolutely although vessels with straight spouts and vessels with spout attachment scars have been found (Pearce 2000; Sürenhagen 1975 [figure 17 X]). Additionally, painted, incised or excised vessels are rare in any form or period. For example, no Ninevite V style incision or excision patterns have been identified so far (for Ninevite incised and excised designs see Numoto 1993). We must emphasize, however, that analysis is just beginning, and these patterns may change significantly.

Table 2: Carbon 14 data from Trench F4.

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 155572	4430 +/- 60 BP	-24.4 o/oo	4440 +/- 60 BP
SAMPLE : KT#4061			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT :	(charred material): acid/alkali/acid		
2 SIGMA CALIBRATION :	Cal BC 3350 to 2910 (Cal BP 5300 to 4860)		
Beta - 166341	4510 +/- 40 BP	-25.9 o/oo	4500 +/- 40 BP
SAMPLE : KT#4157 F4.4023.4157			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT :	(charred material): acid/alkali/acid		
2 SIGMA CALIBRATION :	Cal BC 3360 to 3030 (Cal BP 5310 to 4980)		
Beta - 166342	4700 +/- 40 BP	-25.5 o/oo	4690 +/- 40 BP
SAMPLE : KT#4229 F4.4023.4229			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT :	(organic material): acid/alkali/acid		
2 SIGMA CALIBRATION :	Cal BC 3630 to 3570 (Cal BP 5580 to 5520) AND Cal BC 3540 to 3360 (Cal BP 5480 to 5310)		
Beta - 166343	4820 +/- 40 BP	-24.9 o/oo	4820 +/- 40 BP
SAMPLE : KT#4253 F4.4023.4253			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT :	(organic material): acid/alkali/acid		
2 SIGMA CALIBRATION :	Cal BC 3660 to 3620 (Cal BP 5610 to 5570) AND Cal BC 3600 to 3520 (Cal BP 5540 to 5470)		

Level 1

The first level in Area F consists of several simple pit burials that cut the cobblestone surfaces and other loci of level two. In most cases, preservation is too poor to determine sex or age, but analysis is ongoing. These burials, and consequently this level, are difficult to date. These burials include several excavated during the 2000 season (in trench F1: L1004, L1008, L1011, L1017) and five new burials uncovered during the 2001 season (in trench F1: L1021; in F6: L6004, L6011; in F7: L7006, L7028).

Of the burials preserved well enough for their orientation to be determined, all but L7006 were adult, extended, oriented west-east, with the head to the west, but the orientation of the face could not be determined. In trench F7 L7006 we discovered a child burial oriented west-east with the head to the west facing north. Only L1011 and L1021 contained grave goods, including a spindle whorl that may be a grave good (L1011), a miniature

vessel (L1021 KT1087 [figure 15 L]), and a small juglet that was found cradled in the person's arms (L1021 KT 1118 [figure 15 M]). Loci L1011 and L1021 were found directly on top of each other, but we were unable to determine if they shared the same pit or were separate interments. Although we have yet to find any direct parallels, the juglet found with L1021 is perhaps Early Bronze Age in date. Another feature that likely belongs to this level is a large pit discovered in the baulk of trench F4 (figure 13: 2, 15, 16). Although this pit is not a burial, it appears to be cut from approximately the same level and may therefore be contemporaneous with these burials.

Level 2

This level consists of contemporaneous cobblestone surfaces, found in trenches F1, F2, and F7, small ovens or kilns, found in trenches F2 and F8, and stone installations, found in trench F8. The finds recovered from trenches F7 and F8 during the 2001 season are consistent with previous discoveries in the same area and reinforce our interpretation of this part of Area F as the location of outdoor activity areas. It is also likely that the cobbles encountered in F4 (figure 13: 5) also belong to this level.

We found a fragmentary cobblestone surface covered in pottery and animal bones in F2 (L2003+) and F7 (L7005+) that is at least 6-7m E-W by 2-4m N-S, and continues into the northern baulks. During the 2000 season, an oven/kiln (L2002) was found directly adjacent to this surface in F2. This feature is identical in dimensions and elevation to the oven/kiln (L8002) found during the 2001 season just 4m to the south in trench F8. The cobblestone surface (F2-F7), two ovens/kilns (F2, F8), and three 0.50m diameter stone installations, which may be potstands, (F8) are indicative of an outdoor activity area occupying a space roughly 8m E-W by 10m N-S. If the cobblestone surface (L1006/1009) uncovered during the 2000 season in F1, located 5m west and 5m south of F8, is contemporary with the surfaces in F2 and F8, then this activity area covers 450m sq.[8]

Level 3

Level three consists of several perfectly round pits in trenches F7 and F8, a mud brick wall in trench F7, thick ash deposits in trench F9 (formerly F3), and layers of fill in trench F1. Excavations beneath the level 2 cobblestone surface in trench F1 yielded layers of fill but no features that can be associated with the pits and walls in trenches F7 and F8. Excavations of contemporary levels in trench F9 uncovered ash layers but no architecture, surfaces, pits or burials.

As we removed portions of the cobblestone surface in trench F7, we uncovered two perfectly circular pits, each 1m in diameter, one (L7042) located partially beneath L7029 in the north-central portion of the trench, and the other (L7043), located beneath L7038 in the east-central portion of the trench. These pits were not excavated, so their contents are unknown. Beneath the stone installations and the oven in trench F8, we uncovered two

[8] This number would be quite a bit larger if we included the cobble feature discovered in the baulk of trench F4 (figure 11).

additional round pits. One pit (L8023) was located directly beneath the oven and was adjacent to another pit (L8022), 0.60m in diameter. Both pits were less than 0.30m deep and contained a mixture of soil, ash and animal bones.

In the western half of trench F7, we uncovered the top of a wall (L7033), which runs NW-SE for 4m, cornering seamlessly at both ends with W-E walls continuing east for 1.50m – 2m. The walls are uniformly 0.40m wide, apparently constructed of a single row of mud bricks, although no individual bricks could be identified. We did not excavate further in F7 during the 2001 season and thus cannot describe the number of courses of L7033 that may be preserved, nor is it clear if the walls continue further east.

Levels 4 and 5

Levels 4 and 5 have only been reached in F1 and F4. Level 4 contains a mud brick pavement and an associated square structure, which is probably an oven or kiln. Level 5 contains a round oven/kiln, a pit, and ash deposits. These levels are tentatively dated to the turn of the fourth – third millennium but additional study of artifacts and forthcoming carbon-14 dating is necessary before definitive statements can be made about the chronology.

Level 4

Hoping to reach the Late Chalcolithic layers of F4 from above, we opened trench F1 during the year 2000 field season just a few meters from F4 on the top of the hill. In 2000 we excavated the level 2 cobblestone surface (L1006), about 0.75m below the ground surface, and several intrusive level 1 burials (see above).

Beneath the cobblestone surface and burials, we encountered layers of fill (level 3) that overlay a mud brick pavement, a mud brick structure, and an area of baked clay. The pavement (F1 L1033) consisted of 0.20m – 0.40m by 0.10m bricks laid with the narrow or 'stretcher' side up, oriented E-W in a single course dozens of rows wide, covering nearly the entire northeastern 2/3 of the trench in a 3.5 by 3 meter area. This pavement abutted a 1.25 by 1.25m square brick structure (F1 L1035) with single brick-row walls located just south of the center of the trench. This structure is likely the base of an oven or kiln. Both the interior and exterior of its walls were literally baked into a 0.02 meter thick black, pie-crust-like layer.

The western quarter of the trench at this level consisted of baked clay layers covering the area where the pavement failed to continue. In the southwestern quadrant of the trench, a 1.0 meter N-S by 2.0 meter E-W area of baked clay, ash and smashed pots appears to have cut into both the brick structure (L1035) and the bit of pavement in the southwestern corner (L1032). Taken together, the brick pavement, brick structure and area of ash and baked clay indicate that this space was the locus of oven or kiln work and associated activities, although we did not uncover any specific remains, such as slag or wasters, that would indicate how the ovens/kilns were used.

Level 5

Beneath the pavement, probable oven/kiln and baked clay area, we uncovered the base of yet another oven/kiln (L1054) in the center of the trench, and a small pit in the southeastern corner of the trench. The oven/kiln was round, 1.60m in diameter, with thin, 0.10m wide brick walls preserved only one course (0.10m) high. A large clay stand (KT1246) was found inside this feature. This rectangular stand, essentially a large mud brick with dimensions 0.64m by 0.30m wide and 0.09m high, is located towards the eastern side of the feature. The stand had carefully formed sides, apparently smoothed with a spatula or similar tool. The center of the oven/kiln consisted of baked clay turned bright orange from heating, while the entire area of the trench surrounding this feature was covered with about 0.10m of dark black ash and some patches of yellow clay (similar to the clay discovered in F4, L4043, level 6 [see below]). A few bits of light weight, porous, greenish yellow slag were found in this ash in the northwest corner of the trench, but no other debris or tools were found that might indicate the function of this feature. The slag samples are currently being analyzed.

Levels 6-7

Levels 6-7 have only been reached in F4 and F5, and consist of remains dated to the Late Chalcolithic by ceramics and four carbon-14 samples (only F4 is discussed here, F5 is discussed in the 2000 report [Parker et al 2002a, 2002b]). Level 6 consists of ash-filled pits, fill, and the ash and debris layers found in and around a large oven or kiln (L4009, L4027). Level 7 is the oven/kiln itself, which is the earliest structure thus far excavated in Area F. When we excavate deeper in F1, we may be able to connect the layers in F1 and F4, and in the process identify more levels between 6 and 7. In the following discussion, levels 6 and 7 are discussed together.

Late Chalcolithic remains eroding from the steep eastern slopes of Area F above the Tigris River were first explored during the 2000 season. Slope erosion was removed to create a trench, F4, approximately 3.25m by 3.50m (figure 11 and 13). At approximately 4.3m below ground surface (near the 567m contour line) we discovered a nearly complete whole pot (L4000 KT4027) in a matrix of ashy soil on a packed mud surface (see "Small Finds" figure 17 X and see Parker et al. 2002b). Although the spout of this pot is missing, our original suspicion was that this is an example of a Late Chalcolithic "Drooping Spout" vessel. The extent to which this ceramic type represents the Uruk culture of southern Mesopotamia is a topic of some debate. Nevertheless, this is the only ceramic example excavated thus far that might fall into this category.

Further excavation in trench F4 revealed a large mud brick oven/kiln (L4009, L4027) approximately 2.0m in diameter, half buried in the western baulk 2.60m below the ground surface. The material inside this feature (L4007, L4023+) was partially excavated during the 2000 season and the remainder was removed during the 2001 season. A carbon sample (KT4061) excavated from locus 4004 near the top of the debris accumulated in the oven/kiln yielded a 2 sigma calibrated carbon-14 date of 3350 to 2910 B.C. (table 2). In total, 1.3m of debris was excavated from this feature. This debris consisted of numerous

layers of black, gray and white ash, with occasional lenses of clay numerous animal bones and ceramics (figure 13). These layers curved up against the walls of the oven/kiln, which were composed of 0.15m by 0.7m mud bricks laid lengthwise in two rows and stacked at least twelve courses high. Figure 12 illustrates a sample of the ceramics recovered from within this feature. Note that the above mentioned carbon-14 date provides a *terminus post quem* for this material. The earliest layer of debris (L4023) yielded both a reasonably large corpus of ceramics and three more carbon samples. These samples yielded 2 sigma calibrated dates of 3360-3030 B.C. (KT4157), 3630-3570 B.C. and 3540-3360 B.C. (KT4229), and 3660-3620 B.C. and 3600-3520 B.C. (table 2). The walls of the oven/kiln were sunk into virgin clay, and a 0.40m thick layer of clay loam filled a depression at the base of the kiln, which continued beneath the foundations of the wall. Additionally, the walls of the oven/kiln curved slightly inward, suggesting that the structure originally had a domed roof.

The material recovered from this feature yielded few clues to its function. Instead we interpret this debris as secondary trash deposits. These deposits were rich in artifacts, such as spindle whorls or loom weights made from bored pot sherds, a 12.4 by 2.8cm chert blade (L4007 KT4088 [see "Small Finds" figure 17 Z]), and an andiron or kiln stand (L4023 KT 4225 [see "Small Finds" figure 16 S]). Animal bones were the most common material found inside the kiln. These bones, many of which were burnt, represented a variety of animals including pig and wild sheep (a complete analysis of this material will be undertaken during the 2002 field season). The material found outside the oven/kiln also gave us few clues to its function. The two notable features were pits. Pit L4022/L4033 was excavated directly adjacent to the south side of the oven/kiln at the southern and western baulks. This pit contained a series of ash and clay layers deposited against the outer wall of the kiln, and it appears that these layers derived from the same source that deposited nearly parallel layers inside the oven/kiln. The base of this pit terminated in virgin clay.

Another pit was found just east of the oven/kiln, against the northern baulk. This pit was actually two nested pits (L4034, L4043) that themselves seem to be part of a much larger trench or pit cut into the earth, previously identified as L4026 and L4028. This large cut begins at the same level as the preserved height of the oven/kiln, suggesting that these pits, like the pit south of the oven/kiln, were also cut after the oven/kiln went out of use. This large cut contained layers of clay, ash, and a bright yellow clay not previously noted elsewhere at the site.

Aside from the oven/kiln and pits, F4 contained layers of mixed fill and one possible living surface (L4000). Virgin clay was reached 4.0m to 4.50m below the ground surface. This finding mirrors the depth of deposits found during the 2000 season in sounding F5, located about 15m north of trench F4. The lowest elevation in trench F1, the base of pit L1046, is 0.75m higher than the top of the oven/kiln (L4027) in adjacent trench F4. Since trench F4 was excavated by removing slope erosion until we reached a good context – the top of the oven/kiln – the upper layers were not excavated under close stratigraphic control. Thus, we cannot definitively connect the stratigraphy of F1 and F4 until we remove another meter of material from F1. Nevertheless, it is clear that the two trenches share a similar character, each being the locus of pyrotechnic activities. The oven/kiln in

trench F4 was filled with burned garbage, while similar features in F1 were leveled to their foundations and consequently did not accommodate refuse. The function of the pyrotechnic facilities in these two trenches is still unclear. Our hope is that additional horizontal exposure in coming seasons will connect the trenches, provide a larger context in which to situate the features unearthed so far and clarify the function of these features.

Area F, G, H Soundings

We investigated the depth and extent of the deposits in Kenan Tepe's lower town by excavating several new soundings in Area F and in two newly defined adjacent areas. The first is Area G. Located directly west of Area F (figure 3), Area G is approximately 100 by 150 meters. The second new area, Area H, is located across the drainage to the south of Area F, on a 50 by 50 meter flat promontory adjacent to the eastern slopes of the high mound.

Soundings G1, G2 and G3, each 1m by 1m, all reached virgin soil, a pebble and cobble conglomerate in a sandy matrix, between 0.5m and 1.5m below the ground surface. The soil layers in these soundings contained only a few artifacts that have yet to be closely examined although our initial impression is that this material is not out of place in the Early Bronze and Late Chalcolithic periods of Kenan Tepe's lower town. However, we have yet to identify any features, such as walls or living surfaces. These findings suggest that occupation might not extend west into Area G. Instead, this part of Area G might represent an accumulation of slope erosion, or alternatively, remains in this area might have been eroded away leaving only disturbed shallow remains.

Sounding G4, also 1m by 1m, is of an entirely different character than the other G soundings. Located just 30 meters from the steep northern slope of the high mound, this sounding uncovered several features, including an infant jar burial and associated surface about 1.3m below the ground surface, ash-filled pits at 1.0m and 2.0m, and possible living surfaces at 1.50m, 1.60m, 1.70m, and 2.20m. The jar burial and ash pits, tentatively dated to the Late Chalcolithic Period, demonstrate that the Late Chalcolithic and possibly also the Early Bronze Age site in Area F extends up to and probably under the high mound (figure 14).

A single 1m by 1m sounding in area H failed to reach virgin soil but uncovered deep cultural deposits. At its base, 3m below the ground surface, we excavated a rich deposit containing several kilograms of artifacts tentatively dated to the Late Chalcolithic. As in G4, these findings in H1 indicate that the early period remains in Area F are part of a larger site that extends south along the eroded hillside above the river and likely under the high mound.

In addition to the soundings in areas G and H, a 1m by 1m sounding was excavated within Area F (F10), a 2m by 4m sounding was cut into the southern slopes of Area F (F6), and two 2m wide sections were cut into the northwestern slopes of Area F (F11 and F12).

Sounding F10, located 40m west of the westernmost trenches in Area F, reached virgin clay at a depth of 2.5m, and contained three living surfaces. This sounding indicates

that substantial Early Bronze and Late Chalcolithic layers are to be found in the wide flat area between existing Area F trenches and Area G.

Sounding F6 cut into the southern slopes of Area F, on the north side of the drainage that separates Area F from Area H and the high mound. This trench contained several features, including burials, and virgin clay was reached at 1.75m below ground surface. On the northwestern slopes of Area F, a new field-road cut provided an opportunity to clean two exposed sections. This road cut is located 40m west of the Area F trenches, about 30m north of the F10 sounding (figure 3). These two section scrapings, F11 and F12, indicate that the remains in this area date to the Early Bronze Age, but do not appear to overlay Late Chalcolithic remains. Cultural deposits in F11 and F12 end approximately 1.5m below the ground surface.

The F11 and F12 sections suggest that the Early Bronze Age settlement in Area F extends at least 40m west of the existing trenches, which hug the easternmost hillside of the area. The sections also show that the Early Bronze Age occupation in this part of the site is very thin, and the Late Chalcolithic site does not extend very far north of sounding F10. However, soundings G4 and H1 indicate that significant deposits of the Early Bronze Age and Late Chalcolithic occupation continue up to and probably under the high mound.

THE ARCHAEOBOTANICAL REMAINS

During the 2001 field season at Kenan Tepe, over 715 liters of soil were floated (233 samples). These samples came from seven areas excavated both in the 2000 and 2001 seasons. Of these samples, 125 (a total of 296.7 liters), collected from five areas, contained macrobotanical remains. This section presents the preliminary results of the analysis of approximately 40% of the samples, concentrating on five trenches from three areas (Table 3).

Table 3: Trenches analyzed.

	F4	D4	C2	C3 and C4
Time Period	Chalcolithic	Early 2nd Millennium	Early 2nd Millennium/Iron Age	Early Iron Age
Number of Samples	25	6	37	25
Number of different features sampled	10	6	20	22
Soil Volume	76.5	13.45	106.55	73.45

Kenan Tepe lies on the Tigris River and is surrounded by modern farmlands and desert scrub vegetation. Modern crops include barley, wheat, tomatoes, peppers, and cotton. Today, the site itself is sparsely vegetated, primarily by thorny desert scrub plants,

caperberry bushes, and wild grasses. Archaeobotanical analysis concentrated on the Late Chalcolithic, Early Second Millennium, and Early Iron Age deposits.

The early samples contained uncharred seeds of cf. *Onobrychis*, *Peganum harmala*, *Heliotropium*, and cf. *Onopordum*, as well as other modern plant material. In order to establish a baseline, our initial sampling strategy involved obtaining a sample from every locus. After examination of each type of locus excavated, selective sampling was employed to maximize the chances of recovering macrobotanical material. Hearths, pits, and floors were the most productive in providing archaeobotanical remains. Samples obtained at the end of the season contained charred cultigens, field weeds, riparian plant seeds, weed seeds, and other plant parts (primarily rachis fragments, glumes, and internodes). Most of the cultigens were highly degraded and fragmented, resulting in indeterminate cereal and legume identifications. No pure caches of cultigens were recovered (Table 4).

Crops and Wild Plants

Late Chalcolithic – Of the cereals identified to genus level, barley (*Hordeum* sp.) is the most common. The grains did not appear to be twisted and thus these cereals are tentatively identified as two-row hulled barley (*H. distichum*). Rachis internodes and fragments were also recovered. The remaining cereals were too degraded or fragmentary to identify to even the genus level. However, wheat rachis fragments were recovered, so it is likely that some of these cereals are wheat (*Triticum* sp.). One type of cultivated legume was identified, bitter vetch (*Vicia ervilia*). The indeterminate legumes could be either bitter vetch, grass pea (*Lathyrus*), or field pea (*Pisum sativum*). Today, grass pea is primarily fed to animals, as consumption by humans can lead to toxic effects (Miller 1996). No orchard crops have yet been recovered from Chalcolithic deposits. Grapes have been identified from Chalcolithic deposits of Euphrates Valley sites (see below), but were not recovered at Kenan Tepe. This is not particularly surprising; grapes did not become important in the Near Eastern economy until the third millennium (Miller 1991).

The cultigens were not found in pure caches, but in combination with various field and riparian weeds. The cereals were found with plants parts (such as rachis fragments, glumes, and internodes) and field weeds (*Polygonum*, *Malva*, *Chenopodium*) that suggest cereal processing was taking place on site (Hillman 1984). This processing would have taken place before storage or transport of these crops, indicating the crops were grown at or near Kenan Tepe.

Early Bronze Age/Early Second Millennium – The cereals recovered were not identifiable to genus level. The only other carbonized seeds identified were cf. *Onobrychis*, *Heliotropium*, and an indeterminate cultivated legume. The excavations in this area are in the early stages, but show promise for future seasons. The cereals recovered were in the lowest strata excavated during 2001. The next field season should produce more identifiable archaeobotanical remains.

Early Second Millennium/Iron Age – The cereals identifiable to genus level were wheat, specifically bread or hard wheat (*Triticum aestivum/durum*). The indeterminate cereals likely include barley; barley rachis fragments were recovered. The legumes identified include lentils (*Lens culinaris*), field pea, bitter vetch, and grass pea. Grape (*Vitis* sp.) seeds are relatively abundant in these deposits. Though the pips are plump, it is not certain whether they represent the wild or cultivated variety since Kenan Tepe lies within the natural range of wild grapes (Zohary and Hopf 1988). This area contained the highest diversity of field weeds and other weed taxa. Field weeds include wild mustard (*Neslia*), wild legumes (*Astragolus*, *Coronilla*, *Trifolium*, *Trigonella*), *Amaranthus*, *Chenopodium*, *Rumex*, *Salsola*, and *Silene*. Riparian weeds include *Carex*, *Suaeda*, and *Eleocharis*. The wild taxa consisted primarily of cf. *Onobrychis* and *Heliotropium*.

Again, as with the Chalcolithic deposits, the cereals were found with plants parts (such as rachis fragments, glumes, and internodes) and field weeds (*Amaranthus*, *Chenopodium*, Leguminosae, *Rumex*, and *Neslia*) that suggest cereal processing was taking place on site (Hillman 1981).

Early Iron Age - Excavation of these deposits are in the early stages and future field seasons should provide additional archaeobotanical material for analysis. Many of the samples from this area contained modern, uncharred seeds from the top few strata of the trenches. The indeterminate cereals were recovered from the lower strata of the trench that was excavated in both the 2000 and 2001 field seasons. A single grape seed was recovered from trench C4. At this stage, no legumes have been identified. The most common field weed recovered is *Fumaria*. Other weeds include *Galium*, *Salsola*, wild grasses, and wild legumes.

Environment

The plant types found at Kenan Tepe today are characteristic of uncultivated or disturbed areas. There are active springs on two sides of the site that contain riparian vegetation. Preliminary analysis suggests that during prehistory the site was surrounded by agricultural fields. Barley, wheat, and various legumes were grown for human and animal consumption. Other legumes, field weeds, and disturbed ground forbs were probably tolerated for animal fodder and human use (Behre 1990; Van Zeist and Bakker-Heeres 1985). The most useful clue suggesting the possibility of environmental change over time is the apparent decrease in the amount of charcoal recovered across the four broad periods discussed above. The Late Chalcolithic deposits contain large amounts of charcoal of various tree types. Most of these charcoal pieces are larger than those found in later deposits. Charcoal pieces become smaller and of less quantity from the Late Chalcolithic to the Early Iron Age. There is also a greater diversity of field wields included in the later deposits. These data suggest that wood charcoal was giving way to animal dung as a source of fuel at Kenan Tepe. These data agree well with many pollen cores examined in the Near East that suggest deforestation associated with increasingly intensified human

occupation over time (Behre 1990; Van Zeist and Woldring 1978; Van Zeist and Woldring 1980) and with textual sources especially from the Assyrian Imperial period (Lanfranchi and Parpola 1990; Parker 2001). Grape seeds were only found in deposits representing later time periods and may reflect changes in crop production that will also be reflected in the cereals.

Table 4: Ubiquity of Common Types by Time Period. Ubiquity is a measure of the number of samples in which a particular taxon is present, expressed as a percentage of total samples.

	Chalcolithic	Early Bronze Age/2nd Millennium	2nd Millennium/ Iron Age	Iron Age
Barley	10		5	
Wheat			5	
Indeterminate Cereal	10	17	30	9
Lentils			5	
Field Peas			15	
Bitter Vetch	10		10	
Grass Pea				
Leguminosae (cultivated)	10		20	
Grape			30	5
Astragolus			10	
Chenopodium	10		10	
Fumaria				9
Malva	10		5	
Neslia			15	
Polygonum	10			
Rumex			10	
Leguminosae (misc)			5	5
Carex	10		10	
Gramineae (misc)	10		15	5
Heliotropium		17	5	18
Lithospermum	10			5
Onobrychis		33	10	18
indeterminate weeds	40	17	40	14
Cereal Fragments	10		30	5
Wheat Glumes			10	
Wheat Rachis	10		15	
Internodes	10			
Barley Rachis			5	

Comparison with Other Sites in Eastern and Southeastern Turkey

The Chalcolithic deposits at Kenan Tepe are similar to Kurban Höyük, Korucutepe, and Hacınebi Tepe except for a lower diversity in legumes and the lack of grapes and flax. The Early Bronze Age/Early Second Millennium deposits at Kenan Tepe are still in an early stage of excavation and did not provide sufficient comparative archaeobotanical material. The same is true for the Early Iron Age deposits. Cultivated crops in later second millennium deposits at Kurban Höyük and Kenan Tepe are quite similar at the genus level. Both sites contained the basic crops associated with the Near Eastern Agricultural Complex. This same suite of crops is found across the Fertile Crescent during the third and second millennia B.C. (Meegan *In Progress;* Miller 1991; Van Zeist and Bakker-Heeres 1985).

Table 5: Presence/Absence Comparison with Other Sites in the Region.

	Kenan Tepe	Kurban Höyük	Korucutepe	Hacınebi Tepe	Kenan Tepe	Kurban Höyük	Kurban Höyük	Kenan Tepe	Kenan Tepe
	Chalco	Chalco	Chalco	Chalco	EBA/2nd Mill.	EBA	Bronze Age	2nd Mill./Iron Age	Iron Age
Barley	x	x	x	x		x	x	x	
Wheat	x	x	x	x		x		x	
Indeterminate Cereal	x	x			x	x	x	x	x
Lentil		x	x	x		x	x	x	
Bitter Vetch	x		x			x	x	x	
Grass Pea		x				x	x		
Field Pea		x	x			x		x	
Chick Pea						x			
Indeterminate Legume	x					x	x	x	
Flax			x			x			
Grape			x	x		x	x	x	x

Kurban Höyük: (Miller 1986); Korucutepe: (Van Zeist and Bakker-Heeres 1975); Hacınebi Tepe: (Miller 1996)

PRELIMINARY OF THE METAL ARTIFACTS FROM KENAN TEPE

Sixty-five metal artifacts, slags and possible ore samples were discovered at Kenan Tepe during the first two field seasons (2000 and 2001). Some metal artifacts are discussed briefly in the Small Finds section of this report (see below). Twenty-seven samples have been analyzed in various ways in order to identify their composition and the range of high-temperature processes that produced them.[9] This report summarizes the results of metallurgical analysis of ten of these twenty-seven samples. The analysis of the remaining samples is currently ongoing. All analyzed samples included in this report were subjected to SEM photographic and X-ray based elemental analysis using either proton induced X-ray emission with Rutherford Back Scatter analysis (PIXE with RBS) or energy dispersive X-ray analysis (EDX). The microstructure and corrosion components were examined under various light regimes. Scanning electron microscope (SEM) and EDX analysis give initial qualitative information on the structure and composition of each sample. PIXE was used for quantitative analysis and in order to identify trace elemental concentrations and variations within each sample matrix. PIXE mapping was especially useful with the iron slags that had great internal variation.

[9] Analysis of the metals from Kenan Tepe was conducted at Oxford University, Department of Materials, Los Angeles County Museum of Art, Conservation Department and at the University of Southern California, Center for Electron Microscopy and Microanalysis. We wish to thank the staff at all of these institutions for their assistance to the UTARP project.

Copper and Bronze

Two copper and low-tin bronze artifacts were found at Kenan Tepe (C1 L1045 KT1315 and C2 L2028 KT2231).

C2 L2028 KT2231 is a copper wire bent in the shape of a staple. SEM analysis revealed large amounts of copper in the center of this sample. No trace element analysis was conducted but qualitative EDX indicates the presence of some tin and other alloy elements. The corrosion in the sample does not penetrate all the way to the center but the envelope of corrosion is complete and is totally consistent with ancient, naturally developed corrosion products for a fairly pure copper or low-tin bronze.

This sample (C2 L2028 KT2231) was discovered in a context dated to the Early Iron Age through ceramic analysis. This locus consists of an ash pit filled with fairly clean gray and white ash (L2028). This pit is adjacent to a slightly higher pit filled with a mass of concreted pottery and stone, and to an area where reddened and possibly burned earth lined a hole subsequently adopted by an animal as a burrow. Although no domestic ovens were discovered in this area, parts of a thick mud brick oval wall was preserved indicating that the top part of the pit may have been encircled by a structure or retaining wall.

C1 L1045 KT1315 is a piece of copper that may represent debris or "splatter" resulting from copper working. Its center is malachite and the outside is cuprite. PIXE maps identified approximately 5% tin bronze with small amounts of arsenic and lead. Unfortunately, the state of corrosion impeded an exact analysis of the tin concentration. This sample (KT1315) was found in a context surrounded by rocks and containing a basalt grinding stone. The layers above and below its find spot are described as bluish, as are two areas located approximately a meter away. The excavators described this bluish area as a layer of thin blue crust containing pebbles. This find may be the result of copper processing.

Both this copper sample (C1 L1045 KT1315) and one of the iron samples (see below, C2 L2041 KT2290) were discovered in different trenches in the same general area of the mound. The ceramics in these two loci (C1 L1045 and C2 L2028) are nearly identical although the trenches are separated by about 30 meters of horizontal distance. These contexts are thus stratigraphically related by the ceramics, which is early to mid second millennium in date and which include types belonging to the Red-Brown Wash Ware assemblage discussed here and elsewhere.

Table 6: Elemental Analysis. Bronze/copper Samples.

KT #	Al	Si	Mg	P	S	Cl	K	Ca	Ti	V	Cr	Mn	Co	Fe	Ni	Cu	Zn	As	Hg	Pd	Sn
C.1.1045.1315 2	0.22	0.27	n/a	0.06	0.16	0.67	n/a	n/a	n/a	n/a	0.02	n/a	n/a	0.13	0.03	90.9	0.25	0.37	n/a	5.28	n/a
C.1.1045.1315 3	n/a	5.27	0.62	0.5	0.28	0.19	0.14	n/a	n/a	0.04	0.04	0.01	0.02	0.34	0.15	63.5	0.08	1.37	n/a	24.3	n/a
C.1.1045.1315 4	0.54	27.6	0.62	n/a	n/a	0.14	0.66	1.65	0.02	0.26	0.08	0.03	n/a	0.66	0.03	68.4	0.16	n/a	n/a	0.22	n/a

Lead

D4 L4022 KT4106 is a lead pin. The object has a normal value for smelted lead containing 82.61% lead. This object is made of a thick wire, approximately round in cross section, which is bent into a loop to encircle the shaft (see Small Finds below and figure 16 P). The end of the pin was blunt when found and already oxidized, indicating that it may have been broken or clipped in antiquity. D4 KT4106 was discovered in the NW corner of trench D4 in what may have been a work area (D4 L4034) where pyrotechnical activities were carried out. Slag, plaster and ceramic artifacts were also found immediately beneath the find spot of this lead object. This underlying level included a plaster-lined pit that was associated with ashy deposits (D4 L4033). Preliminary pottery analysis indicates these loci date to the early second millennium B.C.

Iron

The most notable component of the metallurgical assemblage at Kenan Tepe is the relative abundance of iron. Small quantities of iron slag were discovered in all areas of the site. This includes Area F where Chalcolithic levels have been discovered in abundance. However, in this case the context is suspect and the iron sample almost certainly derives from a later, partly eroded layer. Iron rich slag was located in secure, sealed contexts in the other areas including: the step trench (A2); the Early Iron Age areas (B4, C2); and the early second millennium areas (lower C2, D4, D5 [figure 2]). The latter areas have been dated by AMS and through typological ceramic analysis to approximately 1800 BC +/- 100 years (see above).

Trench A2

Two iron-rich samples were excavated in the step trench (A2). The first, A2 L2012 KT2149 is a porous, high iron content slag. Although our dating of the sequence in this trench is still ongoing, a preliminary analysis of the ceramics contained in this and the surrounding loci suggest a date in the early second millennium. The PIXE map indicates an overall iron concentration of approximately 11% although iron rich areas of up to 98% were identified (table 7). The context for this sample is a small group of rocks, including river cobbles and either river concretion or conglomerate. The locus in which this sample was discovered overlies a substantial ashy area at the same level as a thick, seemingly reinforced oven or kiln. This feature was fairly well-preserved and had a much thicker wall than one might expect if this were a domestic oven. Nevertheless, the exact nature of this context is difficult to interpret. No other slag samples were discovered in or around the oven/kiln feature. The slag was found near but not in the oven and no ceramic kiln debris or indications of ceramic firing were discovered in or around this feature.

Another sample was found higher up in the step trench. This sample, A2 L2010 KT2290, is also very porous, but unlike A2 L2012 KT2149, the iron content of this sample is less pronounced. PIXE maps indicate the sample is approximately 22% iron (see

table 7). There are high concentrations of silicon, oxygen and calcium indicative of a rock or mineralization. A2 L2010 KT2290 may be ceramic slag or a refractory material, or this could be a piece of slag with a large amount of mineral inclusion. A2 L2010 KT2290 was found in association with a dual set of walls founded on a cobbled surface. At some point the cobble layer and walls were subjected to burning. Otherwise, there are no indications of a kiln, furnace, or oven in this area. It is therefore possible that the sample is a result of an accidental firing at high temperature accomplished when this room or section of room burned. In any case, this sample is the least indicative of metal slag, both metallurgically in terms of its iron content and archaeologically in terms of its context.

Trench B4

B4 L4000 KT4046 was discovered in the topsoil locus of trench B4, which so far contains Early Iron Age remains (figure 2). The global map for this sample indicates that it is largely Fe_2O_3 and Fe_3O_4. These reduced iron oxides are the sort found in slag and in hammer scale. There is less than 0.1% of copper, which is well below the 0.5% threshold that Tylecote argues is the minimum required to associate iron with copper slag runoff.[10] An iron rich point in the sample is almost entirely the more reduced Fe_2O_3 and Fe_3O_4 is not detectable at this location. PIXE analysis done on a mineral rich point indicates there is some internal variation within the sample. The lack of any other slag in the immediate vicinity suggests either a small-scale pyrotechnological activity, or erosion has removed most remnants of a larger scale pyrotechnic activity.

B4 L4013 KT4242 This slag sample was subjected to EDX analysis only. It has a high iron content, probably above ninety percent (90%). The sample was excavated from an extensive ashy layer that extends below a circular ceramic-walled oven. This layer has not yet been exposed enough to characterize it in better detail.

Trench C2

C2 L2004 KT2035 came from trench C2, the same trench that produced the copper wire sample (C2 L2028 KT2231). Under polarized light this sample exhibits red coloration indicative of oxidized iron. There is a high concentration of silicon and calcium as well as a very large amount of iron (table 7). The PIXE map indicates that there is an overall concentration of 71% iron, with areas as rich as 89% iron. The high iron content is indicative of a slag or might also indicate that this is a slag fragment associated with some form

[10] Copper ores may be fluxed with iron and thus it is possible for iron to be a by-product of copper smelting (Tylecote et al 1976: 2-3, 40; Cooke and Aschenbrenner 1975). Copper smelting is a common metallurgical process for this period. Iron production is much less common. However, Tylecote (1976) has argued that samples of iron slag that include less than 0.5% copper should not be considered as derivative of copper smelting. The copper iron mixtures found at Tell Brak included copper with about 2% dissolved iron and the iron routinely had 8% dissolved copper in its matrix. Note that because the raw copper used at Brak often contained above 25% dissolved iron, the temperatures necessary to smelt this were near or above 1400 degrees Centigrade. At Brak, the use of high iron content copper yielded a copper-iron rich bloom that is significantly different (uniformly higher copper content) in composition than those found at Kenan Tepe (Shell 1997:121). Further analysis may allow better definition of the process that yielded this slag.

Table 7: Elemental Analysis. Iron Samples

KT #	Al	Si	Mg	P	S	Cl	K	Ca	Ti	V	Cr	Mn	Co	Fe	Ni	Cu	Zn	As	Hg	Pd	Sn
D.4.4022.4016	0.028	0.498	n/a	n/a	0.021	0.371	1.113	2.229	0.0322	n/a	0.165	0.061	n/a	95.075	0.003	0.025	0.031	0.059	n/a	n/a	n/a
A.2.2010.2290 1	11.4	34.6	6.91	0.67	0.1	0.15	7.24	19.8	0.87	0.03				18.2						0.17	
A.2.2010.2290 2	9.56	28.6	11.2	0.26		0.04	5.58	20.9	0.87			0.37		22.1					0.47		
A.2.2010.2290 3	12.5	36.6	6.76	0.47		0.1	11.5	19.7	0.91				0.24	11						0.13	
A.2.2012.2149 1.2	17	43.7	3.05	0.69	n/a	1.26	6.72	15.5	0.63	0.04	n/a	0.19	n/a	7.3	0.02	0.24	0.02	0.05	n/a	n/a	1.38
A.2.2012.2149 2.2	10.2	36.9	3.2	n/a	n/a		9.2	27.7	1.12	0.06	n/a	0.28	n/a	11.3	0.02						
A.2.2012.2149 3.2	9.96	36.9	3.01	0.05	n/a	0.11	0.87	27.6	1.13	0.03	0.05	0.3	n/a	11.2	n/a	n/a	n/a	n/a	n/a	0.83	n/a
A.2.2012.2149 4.2	3.9	18	1.64	0.99	0.66	0.25	0.34	22.6	0.45	0.09	n/a	n/a	n/a	47.8	n/a	n/a	n/a	n/a	n/a	0.14	n/a
A.2.2012.2149 1.1	3.99	18	16.5	0.99	66.2	0.25	3.44	22.6	0.45	0.09	n/a	n/a	n/a	47.8	n/a	n/a	n/a	n/a	n/a	0.14	n/a
A.2.2012.2149 2.1	0.66	0.44	0.54	0.57	0.09	0.52	0.84	n/a	0.1	0.09	n/a	n/a	n/a	88.4	n/a	n/a	n/a	n/a	0.55	n/a	n/a
A.2.2012.2149 3.1	7.87	54.3	4.67	0.54	0.22	0.12	2.13	16.3	0.29	0.07	n/a	n/a	n/a	13.4	n/a	n/a	n/a	n/a	0.06	1.08	n/a
A.2.2012.2149 4.1	0.05	0.45		0.67		0.62	0.26	1.07	0.1	0.1	n/a	n/a	n/a	97.8	n/a	n/a	n/a	n/a	0.12	n/a	n/a
B.4.4000.4046	n/a	0.058	n/a	n/a	0.016	0.645	0.127	0.492	n/a	n/a	n/a	n/a	n/a	98.653	n/a	0.0099	n/a	n/a	n/a	n/a	n/a
C.2.2004.2035 1	23	16.1	1.02	0.51	0.1	0.17	1.56	4.48	0.25	0.38	n/a	n/a	n/a	71.9	n/a	n/a	n/a	n/a	0.17	0.36	n/a
C.2.2004.2035 2	1.24	17.2	0.58	0.75	0.11	0.15	0.65	0.65	0.36	0.43	n/a	n/a	n/a	75.1	n/a	n/a	n/a	n/a	0.19	n/a	n/a
C.2.2004.2035 3	10.3	61.9	3.62	1.46	0.15	0.23	5.29	5.79	5.79	0.04	n/a	n/a	n/a	0.82	n/a	n/a	n/a	n/a	n/a	n/a	n/a
C.2.2004.2035 4	0.83	4.72	0.53	0.3		0.1	0.08	3.32	0.05	0.45	n/a	n/a	n/a	89.1	n/a	n/a	n/a	n/a	0.17	0.25	n/a
C.2.2041.2290	19.1	33.6	0.84	n/a	0.04	1.78	0.41	23.1	2.93	0.04	0.03	0.25	n/a	16.7	n/a	0.03	0.03	n/a	n/a	1.23	0.19
D.5.5044.5177	0.028	0.498	n/a	n/a	0.021	0.371	1.113	2.229	0.322		0.165	0.061	n/a	95.075	0.003	0.025	0.031	0.059	n/a	n/a	n/a

of smithing. C2 L2004 KT2035 is a piece of mineralized iron that was found directly above an ash pit. The locus is attributed to the Early Iron Age through ceramic remains that include Early Iron Age corrugated bowls and Early Iron Age indigenous painted ware (Parker 2001: 288). This sample was discovered just below the topsoil layer. The excavators did not find any intact oven, kiln, structure, or furnace remains, but did record evidence of burning. In view of the sample's composition, we speculate that this sample is the product of bloom refinement or smithing.

C2 L2041 KT2290 is a sample that contains high concentrations of silicon, oxygen and calcium, which is normally indicative of a rock or mineral composition. PIXE analysis indicates an overall concentration of 17% iron. The copper content of this sample is 0.03%, which does not overtly support an interpretation of this iron slag as derivative of copper processing. This sample was found directly underneath the Early Iron Age ash layer or pit in which C2 L2004 KT2035 was discovered. This lower layer in which produced C2 L2041 KT2290 may be dated to the early to mid second millennium B.C. We therefore have two samples that have higher-iron inclusions inside a matrix of lower-iron slag and both come from areas in which ash is a predominant feature of the context.

Trench D5

D5 L5044 KT5177 is a slag sample made up of 94.7% iron oxide, 0.003% nickel and 0.322% tin (table 7). In addition, and a barely detectable copper trace of 0.03% was identified using PIXE. Spot analysis on an iron rich area shows the composition to be predominantly Fe_2O_3 and Fe_2O_4 with 2.2% calcium carbonate. Thus far there is no indication that a meteoritic origin for the iron inclusions should be considered.[11] No copper or bronze samples have so far been identified in this area and there is no indication that copper processing occurred here. The context for this sample is the north end of trench D5. The locus is sealed beneath a surface and mud brick collapse. The pottery from D5 L5044 has not yet been fully analyzed, but preliminary study indicates this context underlies loci that have been attributed to the early second millennium B.C.

Implications of the Metals Analysis

The early date of the iron finds from Kenan Tepe is notable, as is the fact that the iron slags lack most substances aside from iron and calcium carbonate. For instance, the levels of silicon, potassium, aluminum, and manganese are quite low and imply that these are very clean slags. It is difficult to determine whether the inhabitants of Kenan Tepe were intentionally making iron or whether these samples are a by-product of other pyrotechnic activities. With iron rich rock in abundance in the surrounding area, and with so

[11] Meteoritic composition between 5% and 20% nickel would be expected, with low carbon content. It is possible that nickel content can be leached from samples by water action, which would complicate the identification of meteoritic origin.

little else in these slags aside from iron and calcium carbonate, (which can act as a flux) there was little else to fall out but iron, if only sufficient heat were applied.

Based on this preliminary study, it is apparent that copper and low tin bronzes were being used or made on the west side of the mound. There is too little evidence to interpret the scale of metal working as anything other than small-scale or non-intensive. Iron is an important resource in this region and seems to have dominated the metallurgical universe at Kenan Tepe, at least on the basis of two seasons of excavation. We speculate that the discovery of iron rich slag in early second millennium contexts may be evidence of early experimentation with iron making, perhaps a result of adventitious or accidental processes originally unrelated to deliberate iron smelting. This is based on slag and iron debris that show little or no evidence of copper or tin except at the very lowest of trace levels, and which have high levels of heavily reduced calcium and carbon in the slag. Further analysis is underway and will hopefully provide additional data as a foundation for more specific conclusions about the scale and intentionality of the pyrotechnic processes that yielded these metal objects and iron rich slags.

Preliminary Synthesis of the Cultural History of Kenan Tepe

After two seasons of excavation we are now in a position to offer a preliminary analysis of the cultural history of Kenan Tepe. However, we must emphasize that the conclusions presented here are preliminary and our interpretation of these data may change in subsequent reports.

The initial research discussed above indicates that Kenan Tepe was occupied during four broad time periods: the Late Chalcolithic, the first half of the Early Bronze Age, the early second millennium and the Early Iron Age. Remains dating to the Late Chalcolithic and the first half of the Early Bronze Age were discovered in abundance in Area F. Soundings in areas F, G and H suggest that the northern and western portions of Area G in the lower town were either not occupied during these periods, or erosion has removed significant amounts of these deposits. However, the same soundings show that there are deep deposits dating to the Late Chalcolithic and the first half of the Early Bronze Age in the southern portion of Area G and in Area H. The extent to which these deposits, which reach a depth of more than three meters in G4 and H1, are composed of debris eroded from the main mound remains to be determined. If the disturbed upper deposits in trench A2 are any indicator, we can expect as much as one meter of deposition, especially in Area H, to be cultural debris re-deposited by erosion from the slopes of the main mound. Data from soundings G4 and H1 also suggest that there may be significant remains dating to these periods buried underneath Kenan Tepe's main mound (see above).

These data have several important implications. First, since the remains dating to the Late Chalcolithic and the Early Bronze Age are not covered by later material, the data suggest that Kenan Tepe probably reached its largest extent during the late fourth and early third millennia B.C. Several variables make it difficult to be more precise in our

estimates of the total size of the site during these periods. These variables include: whether or not all of Area G was occupied, whether early remains extend under the main mound, and the extent of occupation in Area H. Another consideration is the site size fluctuation between the Late Chalcolithic and the Early Bronze Age. Finally, our team has yet to adequately explore the terrace south of the main mound (this terrace is not illustrated on figure 3). Taking into consideration all of these variables it is premature to give any site size estimates. It is nevertheless quite clear that Kenan Tepe was a relatively large town during the Late Chalcolithic period when the absolute site maximum may have reached as much as five to six hectares. If we exclude the main mound and portions of Area G, then this number could drop to around three hectares. Similar numbers could be assumed for the first half of the Early Bronze Age.

The nature of occupation during the Late Chalcolithic and Early Bronze Age uncovered at Kenan Tepe is very interesting. Thus far, none of our trenches in Area F have yielded domestic architecture. Instead, these levels are characterized by several large ovens, some up to 2 meters in diameter (figure 13 for example), and significant ash deposits. These data indicate that during the Late Chalcolithic period, Area F at Kenan Tepe was home to some kind of production requiring the use of fire. Archaeobotanical remains from the kiln in trench F4 included charcoal from various tree types suggesting that wood or wood charcoal was the predominant fuel during the Late Chalcolithic. Unfortunately, the artisans in charge of production were evidently quite meticulous as they regularly cleaned their ovens and, in doing so, not only spread large amounts of ash around their production area, but also disposed of any by-products of their production.

It is also interesting to note that a preliminary analysis of the ceramics from Area F has not yet revealed any of the characteristic "Uruk" style ceramics. Instead, this appears to be a regional Anatolian late Chalcolithic assemblage. The only exception to this is a nearly complete ceramic vessel that, although its spout is missing, might be an example of an Uruk style "drooping spout" vessel (figure 17 X).[12] Nor have we recovered any of the other "markers," such as Uruk glyptic, clay cones and accounting tools, commonly used by scholars to argue for the direct involvement, or the presence, of southerners in the Mesopotamian periphery (Algaze 1989b; Stein 1998; 2000). This being the case, the potential to research the effect (or lack of effect) that the so-called "Uruk Outreach" (Algaze 1993; Pollock 1992; Rothman 2001; Stein 1999; 2000) had on the local Late Chalcolithic population of southeastern Anatolia is obvious. In future seasons part of our research agenda will be to discover if pyrotechnical production at this Anatolian town was driven by local, intra- or interregional demand, to investigate whether or not local elites controlled production, and to examine how interregional contact affected the development of complexity at the site.

In the meantime we are conducting a comprehensive analysis of the most reliable loci excavated from our Late Chalcolithic contexts in an effort to clarify the Late Chalcolithic ceramic sequence at Kenan Tepe and contribute to the analysis of the overall chro-

[12] It may be significant that this vessel appears near the end of the Late Chalcolithic sequence (see below).

nology of interregional interaction in this period (cf. Wright and Rupley 2001). Figure 12 illustrates the ceramics excavated from a well preserved oven/kiln (L4009/L4027) in trench F4 (discussed above). Fortunately this feature was sealed by later debris while the oven/kiln walls, which are preserved to a height of 1.3 meters provide clear boundaries for a series of undisturbed archaeological contexts. Furthermore, two of these contexts provided datable carbon-14 samples (C-14 graphs are presented as table 2). The earliest C-14 samples, which come from the lowermost locus in the oven/kiln, yielded 2-sigma calibrated dates of 3360-3030 B.C.(KT4157), 3630-3570 B.C. and 3540-3360 B.C. (KT4229), and 3660-3620 B.C. and 3600-3520B.C. (KT 4253). Another date comes from a sample taken from near the top of the kiln in a locus just below that which contained the possible "drooping spout" vessel illustrated as figure 17 X. This sample yielded a 2-sigma calibrated radiocarbon age of 3350 to 2910 B.C. (KT 4061).

In discussing these dates and the ceramics from within the oven/kiln, several issues come to mind. To begin with, since three of the carbon samples (L4023 KT4157, KT4229 and KT4253) are from the same sealed context we would expect these dates to fall relatively close to each other. This is not the case. In fact, one of the dates (L4023 KT4157) is significantly later than the other two. Given the nature of the context (L4023) we see no reason to believe that debris could have accumulated in this locus for several hundred years. One factor that may have contributed to the difference in these dates is the material analyzed: L4023 KT4257 is charred material while L4023 KT 4229 and KT4253 are organic material. Nevertheless, the fact that the other two samples (L4023 KT4229 and KT4253) are so close together suggests that these dates are more reliable.

If we follow this line of reasoning and we assume that the ashy debris in the lowest level of oven/kiln L4009/L4027 began to accumulate during the late LC 3 or early LC 4 (see Rothman 2001: 5-8 for a discussion of this terminology) somewhere around 3500 B.C. Furthermore, since this feature is built into virgin soil the Late Chalcolithic occupation at Kenan Tepe, or at least the operation of the pyrotechnic facilities in Area F, may also have begun at or around the same time. The oven/kiln fell out of use and filled with debris, the upper levels of which date to the middle or the end of the LC 5 period somewhere around 3100 B.C. These parameters also pertain to the ceramics illustrated in figure 12: this corpus should represent a relatively late set that slightly post-dates Hacınebi B2 (Pierce 2001; Pollock and Coursey 1995). Although preliminary, these data lead to several interesting conclusions. First, if we assume that the first layers of debris that accumulated in oven/kiln L4009/L4027 mark the beginning of its use-life then this evidence suggests that occupation at Kenan Tepe, or at least the utilization of space in Area F, probably begins quite late in the Late Chalcolithic sequence. Unlike other sites in Turkey such as Arslantepe and Hacınebi there does not, so far, appear to be a long development through the LC sequence. Second, the dating of oven/kiln L4009/4027 places Kenan Tepe's Late Chalcolithic occupation in the midst of the "contact period" at Hacınebi (period B2) when the material culture shows a significant amount of intrusive southern Mesopotamian elements. Although our exposures to this period are still limited,

such elements are conspicuously absent from the material culture thus far excavated at Kenan Tepe.

Continuity of settlement between the Late Chalcolithic and Early Bronze Age is quite unusual, at least in comparison with upper Mesopotamia and the upper Euphrates basin. Surveys in the plains of northern Iraq (Wilkinson and Tucker 1995) and in the environs of Tell Leilan in the Upper Khabur area (Stein and Wattenmaker 1990) show substantial settlement dislocations in the transition from the fourth to the third millennium. Similar results have been reported in the Upper Euphrates (Wilkinson 1990a; Algaze et al. 1991, 1994). Many scholars have argued that the decline of settlement observed in these areas is due, at least in part, to the collapse of the Uruk regional trade networks linking the large population centers of southern Mesopotamia with resource zones in highland Iran and Anatolia (Algaze 1989b, 1993). Although survey data from the Upper Tigris river region (Algaze 1989a; Algaze et al. 1991) show that this part of southeastern Anatolia was affected by the "Uruk Expansion" (see above),[13] work on survey material from the Cizre Plain and the Upper Tigris River Valley (Parker 2001)[14] suggests that in these areas there is a far greater degree of continuity between these periods. This theory is supported by our excavations at Kenan Tepe where the transition between the Late Chalcolithic Period and the Early Bronze Age is clearly evident in all Area F trenches and five soundings in areas G and H.

Although our exposure in areas G and H and very limited excavation in Area F suggest that the inhabitants of the Early Bronze Age town continued the tradition of pyrotechnic production on this part of the site by constructing new ovens/kilns and creating new deposits of ash and other debris. Two 1 by 1 meter soundings placed in areas G and H (G4 and H1), between the pyrotechnic facilities in Area F and the main mound (figure 3), yielded deep deposits dating to the Early Bronze Age and the Late Chalcolithic Period. Although our sample is still very small, the discovery of a child interred in a large ceramic jar, mud brick debris that may belong to walls, and the abundance of cooking pot sherds, suggests that the remains in these areas are domestic in nature. These data support the hypothesis that habitation in these periods was concentrated in the area of the main mound while the town's pyrotechnic facilities were located outside of the habitation zone in Area F.

In the initial survey of the Upper Tigris River Valley (Algaze 1989a; Algaze et al. 1991) no Middle Bronze Age sites were recognized, suggesting that this part of Turkey was sparsely populated during this period. This theory came as somewhat of a surprise since elsewhere in upper Mesopotamia including the Cizre Plain in the far southeastern corner of modern Turkey (Algaze et al. 1991; Parker 2001), the Khabur plains of Syria

[13] Two major sites, other than Kenan Tepe, were identified in the Tigris-Euphrates Archaeological Reconnaissance Project's surveys of the Upper Tigris River region as being potential "Uruk Outposts". These sites are Basorin Höyük in the Cizre Plian, and Çattepe at the Bohtan-Tigris confluence.

[14] The surveys I refer to here are those of the Tigris-Euphrates Archaeological Reconnaissance Project. Unfortunately only preliminary reports of these surveys are published (Algaze 1989a; Algaze et al. 1991). However the results of the Cizre Survey are now available in Parker 2001.

(Meijer 1986; Stein and Wattenmaker 1990), the Sinjar plains of northern Iraq (Wilkinson 1990b; Wilkinson and Tucker 1995) and in the Upper Euphrates Basin (Algaze et al. 1994), the early second millennium is a period of great florescence. This situation led the authors of the survey report to conclude that "either this portion of the Tigris basin was bypassed entirely by Middle Bronze Age development attested to elsewhere or, more likely, it is characterized by a thus far unreported and unrecognized assemblage (Algaze et al. 1991: 183)." The past two years of excavation at Kenan Tepe have confirmed this assumption by showing that the early second millennium in the Upper Tigris River region is marked by a mixed assemblage that includes components of the Khabur ware assemblage of north Syria alongside a so-called Red-Brown Wash Ware assemblage.

Shapes and wares with this characteristic surface treatment occur at Kenan Tepe in the context of a larger assemblage that has not been previously fully documented, or even identified, as a coherent assemblage (figures 8 and 9). Excavations during the 2001 field season concentrated on the two areas where this assemblage was discovered. This research unearthed well-preserved architectural levels with numerous sealed contexts containing both an array of ceramics belonging to this assemblage and a number of carbon samples.[15] An analysis of the carbon samples both confirmed our assumption that this assemblage dates to the early second millennium B.C. and at the same time underscored the importance of this poorly documented ceramic assemblage as a marker of the early second millennium B.C. in this part of southeastern Turkey.

Well preserved levels dating to the early second millennium have been discovered on both sides of Kenan Tepe's main mound (areas C and D) but were absent from the soundings in areas G and H. Thus it is safe to say that second millennium occupation at the site encompassed the entire main mound but did not extend into the lower town. This being the case we estimate the size of Kenan Tepe's early second millennium occupation to have been 1.1 hectares.

Architectural remains dating to this period include a variety of well-built stone structures. In the case of Area C, these structures appear to be domestic in nature (figure 7), while those recovered in Area D appear to be the remains of a large public building. The structure we theorize to be a public building contains architecture made of boulders as well as a floor or hallway made of decoratively arranged up-standing river cobbles. Several slag pits and apparent metal processing areas were also discovered in Area C. Although the analysis of these data is still underway, a preliminary assessment of the slag samples undertaken at the Los Angeles County Museum of Art, Oxford University, and the University of Southern California suggests that both copper and possibly even iron were being refined, probably from local ore, during the early second millennium at Kenan Tepe.

Since little is known about the nature of occupation in much of southeastern Anatolia during the early second millennium, data from Kenan Tepe promise to be an important contribution to the understanding of frontier dynamics in this period. Although

[15] A preliminary report of this material is currently in preparation.

our sample is still relatively small,[16] a preliminary analysis of the data recovered thus far leads to several interesting hypotheses about the nature of early second millennium society and economy at Kenan Tepe. First, the data show that the total occupied area at Kenan Tepe contracted considerably from its peak at the end of the fourth and the beginning of the third millennia B.C. In spite of this contraction, the architecture thus far recovered in areas C and D on Kenan Tepe's main mound suggests that Kenan Tepe's early second millennium town was relatively prosperous. The regionally distinct nature of the ceramic assemblage combined with the existence of what appears to be a large public building, implies that local authorities maintained control over labor resources in the area. Furthermore, metal processing during the early second millennium probably included both the creation of finished products, and some refinement and purification of raw metals, some part of which may have made its way to non-local markets.

Archaeological data thus far recovered suggests that there was a hiatus of occupation at Kenan Tepe during the Late Bronze Age. Only a handful of sherds of the Middle Assyrian and Mitannian assemblages (Pfälzner 1995; Wilkinson and Tucker 1995) have been identified in the hundreds of ceramics processed during the 2001 field season.

Kenan Tepe was again the home to a flourishing settlement during the Early Iron Age (ca. 1100-900 B.C.). Remains from this period have been discovered in abundance in areas B and C, although there is no indication of Iron Age remains either in the lower town or on the eastern slopes of the high mound (in and around Area D). As noted above, parts of Kenan Tepe show signs of severe erosion. Thus it is quite likely that some of the remains dating to the Early Iron Age were eroded away, especially from the steep eastern and northern slopes of the high mound. This being the case, it is difficult to give a precise estimate of the size of the Early Iron Age settlement. We can be quite certain that at its maximum extent Kenan Tepe's Early Iron Age occupation did not exceed the total size of the main mound (ca. 1.1 ha). However, if erosion did not play a significant role in disturbing the Early Iron Age remains at Kenan Tepe, then the size of the site during this period could be slightly smaller.

In the case of Kenan Tepe's Early Iron Age settlement, it is quite clear that we are dealing with an indigenous Anatolian village. The ceramic assemblage includes types belonging to the "corrugated wares" from Norşun Tepe (Bartl 1994) as well as types previously defined as "indigenous Iron Age" based on survey material from the Upper Tigris River region (Parker 1997, 2001). Although many of the contexts dating to this period are somewhat disturbed due to the proximity of this material to ground surface, we are nevertheless in a good position to evaluate the nature of occupation during the Early Iron Age. To begin with, the chronology of the town appears to be limited to the Early Iron Age, as there is no indication of occupation during the Neo-Assyrian Imperial Period. In fact, it appears that the town was either abandoned or destroyed in the wake of Assyrian

[16] Thus far two 5 by 5 meter trenches in area C and one 10 by 5 meter trenches in Area D have exposed levels dating to this period. It should be noted however, that three 10 by 10 meter trenches in areas B and C, as well as 2 more 5 by 10 meter trenches in Area D should reach early second millennium levels in the coming season.

colonization of the region in the ninth century B.C. (Parker et al. 2002a). Further excavation at Kenan Tepe might, therefore, illuminate the affects that Neo-Assyrian imperialism had on the indigenous population of the Upper Tigris River region.

Excavations have thus far revealed several large walls running, in several cases, the entire length of our excavation units. Walls discovered in trenches C3 and C4 presumably belong either to very large houses or some type of public building. In trench B4 we uncovered large piles of stones. We theorize that these stones belonged either to another large building or, perhaps, to a fortification wall or tower. There is also evidence of metal working during the Early Iron Age. Slag, ovens and outdoor work surfaces have been discovered in abundance in Area C. This material is currently being analyzed at Oxford University and the University of Southern California.

KENAN TEPE 2001: SMALL FINDS ANALYSIS

During the 2001 field season, excavators collected several notable small finds that merit description. These objects can be divided into eight categories: seals, figurines, beads, miniature vessels, metal objects, tokens or weights, ceramic kiln stands, and wagon wheels/toy discs/spindle whorls (figures 15, 16 and 17). The objects in each of these categories will be discussed as groups. A more complete analysis of the corpus of small finds from Kenan Tepe, especially the seals, is currently in preparation.

Seals

A ceramic cylinder seal (F4 L4026 KT4132) incised with geometric intaglio design was discovered in Late Chalcolithic context in trench F4 (figure 15 A). The 27 x 18mm, 9.5g seal is punctured from end to end, but the puncture holes do not bear burnishing, as would result from twine rubbing the surface. The seal has been unevenly fired (or perhaps burnt), such that the majority of the surface is consistently dark grey (Munsell 10YR 4/1) except for an area 15 x 15mm along one side which is very pale brown (Munsell 10YR 7/3). This color difference is visible in the fabric at one end where the seal is badly damaged, revealing very fine grit temper. The seal has relatively straight sides, clearly not convex or concave, but the preserved end bulbs outward in one place. The surfaces of the two ends are not parallel to each other, indicating that the seal was hand formed. The puncture hole at the preserved end is positioned slightly off-center and the edges of each end are rounded to meet the face of the seal.

Figurines

A fragment of a ceramic animal figurine (KT4067) was recovered from mixed fill in trench A4, L4000 (figure 15 B). The very fine grit tempered figurine is consistently black (Munsell 5Y 2.4/1) and appears to have been burned or low-fired at the time of

production. The animal's preserved head, forepaws and abdomen are chipped at the right ear, tip of the nose, and feet. The 12.9g figurine stands 28mm from foot to ear, is 16mm wide and 33mm long. The surface is marked by creases. Other than traces of fingerprints over the entire surface, there is no surface decoration or burnishing and the eyes are not represented. Although the chipped feet cause the figurine to appear strangely proportioned, on the basis of the appearance of the head, the animal may be either a dog or a sheep.

A broken ceramic animal figurine (KT4060) was recovered in early second millennium context in trench D4, L4009 (figure 15 C). The 32.3g animal is preserved from neck to tail, measuring 54mm long, 22mm wide, and 34mm tall at the neck. The light brownish-grey (Munsell 10YR 6/2) fine grit tempered object bears no paint, wash, or other decoration. The head is broken off, but the gentle slope at the back of the neck suggests that the animal's neck was not especially long. The proper left foreleg is broken almost at the joint with the body although the other three intact legs are short and wide. The hindquarters preserve a long tail that curls down the proper-right rear leg. On the basis of the preserved features, the animal may be a dog, or goat, but the tail is too long to be a sheep and the neck is too low to be a donkey or horse.

A fragment of a painted ceramic animal figurine (KT4095) was recovered in early second millennium context in trench D4, L4020 (figure 15 D). The head and hindquarters are missing, leaving a 17.4g fragment measuring 29mm long, 24mm wide, and 44cm tall at the neck. The fine grit and chaff tempered fabric is reddish yellow (Munsell 5YR 6/6). On the basis of the long neck in proportion to the width of the abdomen (18mm) and length of the legs (15mm) and the presence of a small nub between the legs indicating a tuft of fur, the animal is most likely a horse or goat. The very pale brown (Munsell 10YR 8/3) surface bears a single, wide band of dark brown (Munsell 10YR 3/3) paint extending from the nape of the neck to the tip of the feet. This painted decoration is similar to the painted figurine recovered from trench C2 (KT2306) during the 2000 excavation season and is similar, if not identical in color to paint used on KT type 28 ceramics.

Beads

A crudely formed orange-red (Munsell 7.5R 5/6) bead (KT1164) measuring 5 x 8mm and weighing 0.7g was discovered in mixed fill in trench A1, L1035 (figure 15 E). The circumference of the bead is rounded and the edges curve out to join the sides. The bead is punctured by a drill hole that diminishes in width from one side to the other. The bead bears no decoration, although the surface bears a high sheen.

A thin triangular-shaped ivory or bone bead (KT5250) measuring 12 x 7 x 3mm and weighing 0.3g was recovered from fill in trench D5 (L5031 [figure 15 F]). The lower tip of the isosceles triangle comes nearly to a right angle. The hypotenuse is curved from front to back of the bead. Both front and back faces are flat and bear no decoration. The two short sides of the bead are cut flat and form a sharp corner where they meet the contoured hypotenuse. A 1mm wide hole is drilled through the width of the bead, positio-

ned just above the median point on the short sides (3mm from the edge of the hypotenuse). The surface is not polished, but is highly refined.

An undecorated round black stone bead (KT1100) measuring 13 x 13 x 5mm and weighing 1.3g (Munsell 2.5Y 2.5/1) was recovered from Early Bronze or Late Chalcolithic fill in trench F1 (L1020 [figure 15 G]). The top concave face of the seal and the flat bottom face are punctured by a central 3.5mm wide drill hole. The edge at the circumference crests out to a rounded peak. The matte stone bears mild accretion and has two minor chips on one face and at the inner edge of the drill hole. These chipped areas are shiny, suggesting that the material may be obsidian.

A light blue-green round stone bead (KT4180) measuring 7 x 4 x 4mm and weighing 0.2g (Munsell GLEY1 8/5G) was recovered in Late Chalcolithic context in trench F4, L4025 (figure 15 H). The edge around the circumference of the bead is cut consistently smooth. The two undecorated faces are flat, although one face is cut at a minor slant causing one edge to be 1mm thicker than the other. The central drill hole widens at the openings at each face. The stone appears to belong to the quartz family as it seems to be slightly translucent and bears random cracking patterns in the crystalline structure.

Miniature Vessels

A miniature ceramic offering stand (KT4066) was recovered from an unsealed Early Iron Age context in trench B4 (L4004 [figure 15 I]). The 34.1g, 40mm tall stand has a shallow (7mm deep) scooped bowl (52mm diameter) atop a wide neck (25mm diameter) attached to three short legs (9mm diameter each). A new chip and two old chips at the rim of the bowl reveal medium to coarse grit temper in the yellowish red (Munsell 5YR 5/6) fabric and the pale brown (Munsell 10YR 6/3) surface shows chaff inclusions. The half of the vessel not covered by accretion reveals light, uniform burnishing; there is no other surface decoration. The heavily accreted interior of the bowl does not appear to be burnished. One of the three legs appears mildly burned, another bears an old break at the base, but the third is wholly intact.

A miniature ceramic chalice (KT3265) was recovered in Early Iron Age context in trench C3, L3032 (figure 15 J). The 6.5g, 30mm tall chalice is composed of a 22mm wide rounded basin that scoops in to 10mm at the neck and flutes out to 16mm at the base. The straight, rounded rim is damaged by several old chips and an area of loss caused by a new break. The very dark grey (Munsell GLEY1 3/N) fabric of medium grained grit temper indicates low-firing conditions. The pinkish grey (Munsell 7.5YR 7/2) interior bears a residue and corrosion; the exterior is pinkish brown (Munsell 7.5YR 6/2.5). The object is apparently hand pressed; the surface is smooth although a bit wobbly. The side of the bowl with the new break bears burnishing; this burnishing does not continue on the neck. There is no other decoration on the vessel.

A fragment of a miniature bowl (KT 5391) was recovered from trench D5, L5063 (figure 15 K). Half of the bowl is preserved and weighs 28.2g; it is 34mm tall and 48mm wide. The rim curves inward from the body and then turns out slightly to a flattened edge;

the rim is chipped in several places. A new chip at the broken edge of the base reveals brown (Munsell 7.5YR 4/3) fabric with charred chaff inclusions, indicating low-firing. Striations on the dark grey (Munsell GLEY1 4/N) interior and exterior suggest wheel turning; wobbly sides suggest that the wheel apparatus was hand driven. The exterior is reddish brown (Munsell 5YR 5/4) at the rim, grading to Munsell 7.5YR 4/1 at the base. The thickness of the vessel tapers from base to rim with the thickest area at the edges of the base. There is no surface decoration.

An Early Bronze (?) miniature bowl (KT1087) was recovered from a burial in trench F1, Locus 1021 (figure 15 L). The 21.1g bowl is 33mm in diameter and 23mm tall. The bowl's crude appearance, wobbly surface, and uneven base suggest that it was hand pressed from a coil. The simple, rounded rim continues from the body without flaring. The surface has uneven coloring, such that the base is dark bluish grey (Munsell GLEY2 4/1 [5PB]) while the body is red (Munsell 2.5YR 5/6) with one side very pale brown (Munsell 10YR 7/4). The rim is slightly burnished in the pale brown area, but this burnishing does not continue across the remainder of the vessel. There is no other decoration.

A miniature jar (KT1118) probably of Early Bronze Age date was recovered from a burial in trench F1, L1021 (figure 15 M). The 224.5g jar stands 90mm tall and measures 36mm at the neck and 65mm at the body. The body of the coil-formed jar is shaped like a bulb and the rim flares out to a rounded edge. The thick base is slightly flattened but has no foot. The exterior bears a very pale brown (Munsell 10YR 7/4) wash and shows chaff temper. Other than one old chip on the rim and an arc-shaped fracture on the shoulder, the vessel is completely intact. There is no surface decoration.

A Late Chalcolithic shallow, hand-wheel turned bowl with a ring base (KT4300) was recovered from trench F4, L4039 (figure 15 N). This 262.6g fully reconstructed bowl measures 113mm diameter at the rim, 121mm at the body and 35mm at the base. The base is wobbly and the rim ascends and descends irregularly. The rounded rim hooks inward slightly but is continuous with the sides. The reddish yellow (Munsell 5YR 6/6) exterior is burnished with parallel striations spaced an average of 2mm apart. These striations originate at the nub of the base and extend upwards toward the shoulder at a slight diagonal. Another set of diagonal burnishing striations extend from the shoulder upward toward the rim. The red (Munsell 2.5YR 5/6) interior repeats the same burnishing pattern.

A broken miniature offering stand with circular base (KT8075) was recovered in Early Bronze Age context in trench F8, L8007 (figure 15 O). The 16mm diameter neck and 32mm diameter base are intact, although the sides of the bowl are broken, leaving a cross-bar that measures 13mm x 42mm. The 18.2g fragment bears new chips at the widest edges of the bowl, although the major loss results from old damage. The very dark grey (Munsell GLEY1 3/N) surface shows chaff temper, as does the black (Munsell 5YR 2.5/1) fabric at the breaks. The wobbly neck curves slightly and the rounded base slopes upward toward the neck in a slight twist. The top of the object (the interior of the bowl) is flattened. There is no surface decoration.

Metal objects

A lead pin (KT4106) was recovered early second millennium context in trench D4, L4022 (figure 16 P). The 13.2g pin measures 67 x 10 x 5mm and has a light bluish grey (Munsell GLEY2 7/1) surface. The pin is formed by a relatively thick, straight shaft that bends into a needle-eye at the head while the tip of the coil thins and loops around the neck 1.5 times. The blunt end of the pin was sampled, revealing a shiny light colored metal, which was found to be lead (see above).

A copper pin with fiddlehead scroll (KT4160) was recovered in Late Chalcolithic context in trench F4 (L4025 [figure 16 Q]). The 3.0g pin measures 4mm wide and 55mm long and has grayish green (Munsell GLEY1 4/5G) patina covered by dark greenish grey (Munsell GLEY1 4/5G) corrosion. The undecorated shaft of the pin curves very slightly inward and comes to a point while the head of the pin loops around to create a fiddlehead.

Tokens/Weights

A small round stone weight or token (KT4231) was recovered from mixed Early Iron Age fill in trench C4, L4026 (figure 16 R). This dusky red (Munsell 5R 3/2) slightly oblong ball measures 49mm diameter at the widest point and weighs 124.6g. Three-fourths of the surface bears significant accretion, although a smoothed surface is visible on the remainder.

Andiron

An unusual ceramic andiron (KT4225) was recovered from an ash layer (L4023) inside a large Chalcolithic oven/kiln in trench F4 (figure 16 S). This andiron weighs 163g and measures 101mm tall x 125mm wide x 150mm long. The oval base tapers inward along the short axis and gradually forms a neck along the long axis as the top sweeps out to form opposing arms; these arms are broken. The undecorated pale brown (10YR 6/3) surface bears chaff temper and heavy cracking with burn evidence at the top and on one side.

Wheels/Toy discs

A ceramic toy wheel (KT2438) was recovered from trench A2, L2058 (figure 16 T). This 134.1g, palm sized wheel measures 97mm in diameter. It has wide, narrow sides and a 42mm long central axle with an 18mm diameter puncture hole wide enough to insert a wooden stick. The very pale brown (Munsell 10YR 7/4) surface bears chaff temper and two chipped areas at the edge reveal chaff and grit temper. The hand-pressed wheel is not perfectly circular and the surface bears no decoration.

A small ceramic wheel (KT1012) was recovered from trench H1, L1003 (figure 16 U). This crudely formed 6.3g wheel measures 19mm in diameter with funnel-shaped sides

forming an axle measuring 22mm wide. It probably dates to the Early Bronze Age. The very pale brown (Munsell 10YR 7/4) wobbly surface has a highly visible chaff temper. The outer edge around the circumference shows wear; parts of the edge are flattened and lighter in color than the faces of the wheel.

A burned ceramic wheel, spindle whorl or bead (KT5420) was recovered from trench D5, Locus 5066 (figure 16 V). This black (Munsell 10YR 2/1) chaff tempered circular-shaped object measures 30mm x 19mm and weighs 18g. Between its conical top and mildly convex bottom the circumference of the object bears flattened sides with irregular notch impressions. A 7mm wide drill hole punctures the undecorated faces.
Parallels:
Bollweg, catalogue IIIb 22, fig. 41; terra cotta 132mm; Assur [Ass7498]; Neo-Sumerian ca. 2327 – 2042.
Bollweg, catalogue IIIb 18, fig. 39; terra cotta 115mm; Aleppo (Halab); end 3rd millennium

Finds from the Year 2000 Field Season

Because of their relevance to this report, a number of finds from the year 2000 field season are discussed in the previous pages. These finds are illustrated as figure 17 W-Z and are described here.

A chert blade (L4007 KT4088) was discovered in the Chalcolithic kiln (F4 L4009/L4027) described above (figure 17 Z). This grayish brown (Munsell 2.5YR 5/2) blade measures 12.4cm in length and is 2.8cm wide.

In Area C, Trench 2, a ceramic animal figurine was excavated from early second millennium context as KT2306 (figure 17 W). This figurine, weighing ca. 45 grams, measures 68mm from neck to tail, 34mm tall at hindquarters, 32mm tall at the shoulder, and the abdomen measures 19.5mm in diameter. The object is made of high-fired clay of fine silt with sand particles and a chaff temper, with minimal gray firing evidence. A new break reveals the light reddish-brown fabric color (Munsell 2.5YR 6/4). The exterior of the figurine is light greenish-gray at the rear and pink (Munsell 5YR 7/3) at the fore portion.

The figurine retains brownish-gray (Munsell 7.5YR 3/1) paint. One 10.55 millimeter wide paint stripe extends down the back from neck to tail. A stripe of paint extends from the edge of this dorsal stripe down each of the legs. These leg stripes are of a different width: 13mm wide on the proper-right foreleg, 18.5mm wide on the proper-left foreleg,15mm wide on the proper-right rear leg and 17.25mm wide on the proper-left rear leg.

The animal is posed in a static frontal posture with the tail extending straight back such that the spine and tail produce a continuous line. The chest bears a protruding ridge representing the fur between the forelegs. A piece of clay protrudes between the hind legs, possibly representing male genitals or a tuft of fur. The tail is 21 millimeter wide at the base; the tip has been broken. The head is broken off at the neck and the animal is missing

its proper-right foreleg and half of its proper-left rear leg. The proper-left foreleg is chipped close to what appears to be the tip but the proper-right rear leg is intact. Based on the width of the tail at its base, the short legs and the slender profile of the body, the figurine can be identified as a dog.

Figure 17 X illustrates a nearly complete pot (F4 L4000 KT4027) excavated from Late Chalcolithic level just above kiln L4009/L4027 in trench F4. Although the spout is missing, our suspicion is that this is a "drooping spout" pot.

Finally, figure 17 Y is a nearly complete pedestalled vessel excavated from early third millennium context in trench F2 (L2003 KT2017). This vessel has a vertical burnish. This vessel has clear parallels in the Birecik dam area (Sertok and Ergeç 1999; fig. 8 I).

KENAN TEPE'S "GLOBAL RECORD" DATABASE

Over the past three years members of UTARP have been developing a system of digitizing the data recovered from our excavation. The goal of this system is to capture all of the excavated data in a format that allows for data organization, presentation and analysis. The foundation of the information system (called "the Global Record") is a database that was created with Microsoft Access. The architecture created in Microsoft Access interconnects all of our visual and textual information, including scans, digital photographs and text documents. As is true at most excavations, we record units of data at increasingly smaller increments, from "macro data" about the entire site, to more detailed data about a specific trench, to "micro data" about, for example, a single pot sherd. Then we utilize the database to integrate and reconnect all of these levels of data recovery.

Kenan Tepe's Global Record database uses a "tree" of related tables in order to+ organize the individual pieces of information about each stage of excavation and analysis (table 8). The top of the tree is composed of the *area* and the *trench*; these are the most general parts of the database structure. Because everything that we excavate on the site comes from a trench within an area, all of the other pieces of information contained in the database relate back to some combination of these two categories. The next, more specific level of the tree contains *loci* (three dimensional volumes of excavated material). From within each locus there is the possibility that we will collect homogeneous sets of objects (such as pottery, bone, stone, etc.) into separate *KT find bags*. Objects within each KT find bag may be further subdivided for analysis by assigning a unique *item* number to each object. These item numbers are the database tree structure's bottom level, sometimes referred to as leaves.

By separating each of these stages of excavation and analysis into different tables within the database architecture, one can achieve an efficient relational storage structure. Using this structure different stages within the database tree relate to their constituent tables in a "parent-child relationship" and thus related data from different stages can thus be displayed for analysis. For example, if a researcher is viewing a particular animal bone (which is considered an item), he or she can also readily access the information specific to

the locus from which that bone was removed. This process also works in reverse. If for example, a researcher is viewing information about a specific locus, he or she can also access the items within that locus (items such as animal bones, ceramics or other cultural remains).

In addition to the database itself, other useful forms of digital data can be connected through the database structure. At Kenan Tepe we have scanned more than 1500 documents (mostly day plans and artifact drawings) and we have recorded over 5000 digital photographs. Most of these photographs were taken either of specific loci in the process excavation or of items found within loci. These images allow researchers to visually revisit excavation units and to view artifacts found within that unit in order to acquire the most complete understanding of the data. In our information system, when a researcher requests data about a specific locus, he or she is also given immediate access to all of the photographs and drawings of the locus itself and of the artifacts found within that locus. Another example of connecting diverse sets of digital information is our journals. Each day the excavator records the progression of his or her work in the trench. This record is then typed into a Microsoft Word document, which is directly associated with the trench information in the database.

Although the system just described is obviously convenient and fast because it gives a researcher access to all of our excavation data at his or her desktop, by far the most powerful aspect of this system is its ability to search and query. Simply put, by using the search and query functions Microsoft Access, a researcher can sort the data in nearly any conceivable way. A simple type of search might be to ask the database for all contexts within which a specific type of find was discovered. For example, one might request a list of all loci within which obsidian was found. If a researcher wants to find information across many tables, such as all pottery of a certain type that was found within a locus with particular attributes, Microsoft Access provides a powerful tool for producing complex queries. In addition, statistics can be extracted from the data. An example of a statistical query might be volume totals for soil flotation or the amount of botanical remains of a certain type found within total or specific volumes.

The disadvantage of such a system is that the creation of the database is time consuming. We estimate that each of our excavators spends about one to one and a half hours per day on data entry. However, we believe that this time also helps ensure that data is being recorded properly because each day all excavators are forced to look over their notebooks in the process of data entry. In addition, since data entry is completed in real time, this provides the added advantage that there is a continual feed-back loop between data analysis and the focus of daily excavation. Research questions and excavation goals and priorities can be constantly guided as the data is analyzed. For example, as the pottery was read during the 2001 field season, a typology database was being constructed. The real time interface between the analysis of the ceramics and the excavation of specific trenches allowed us to alert excavators to particularly interesting contexts, guide excavation priorities and chronologically link loci both within and between trenches.

By collecting our recorded information into digital form during the season, we also gained some other more practical advantages. The most tangible of these is that we can leave the heavy paper notebooks at the dig house in Turkey, while at the same time presenting various team members with a complete copy of the data to bring home for individualized analysis. As the importance of computers continues to grow in everyday life and in academic research, students will have a need for complete, flexible information sets from multiple sites. Our information system will be readily available to them at the end of each season. We hope that one day such systems will be common and that such systems will eventually be interconnected to allow complex cross site analysis.

The Kenan Tepe Archaeological Database Tree Structure

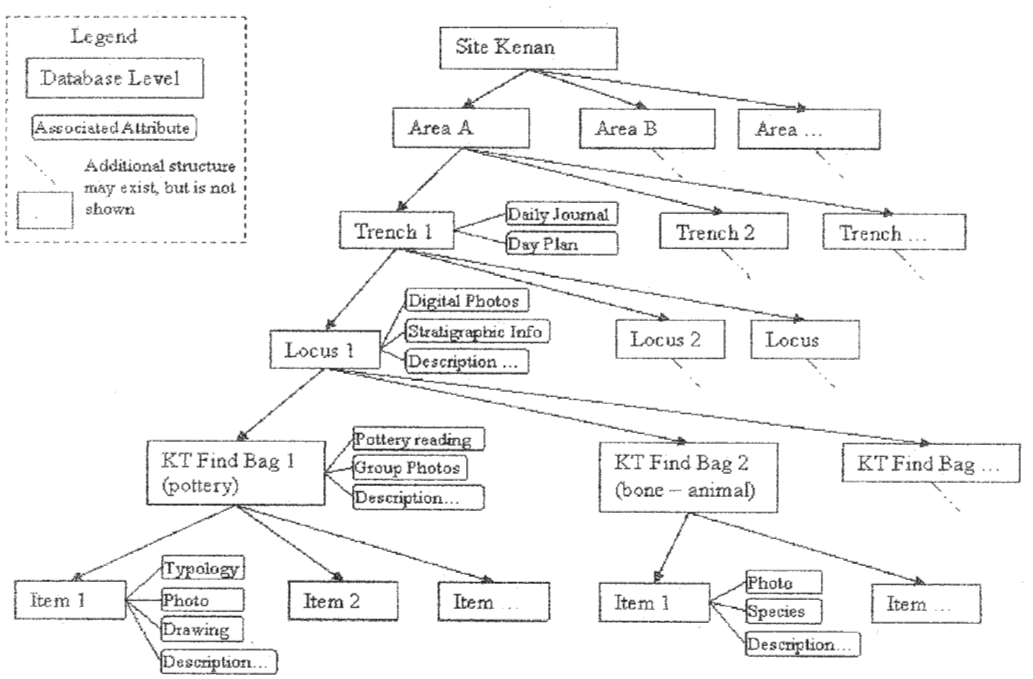

Table 8: Diagram of the structure of the Kenan Tepe Database.

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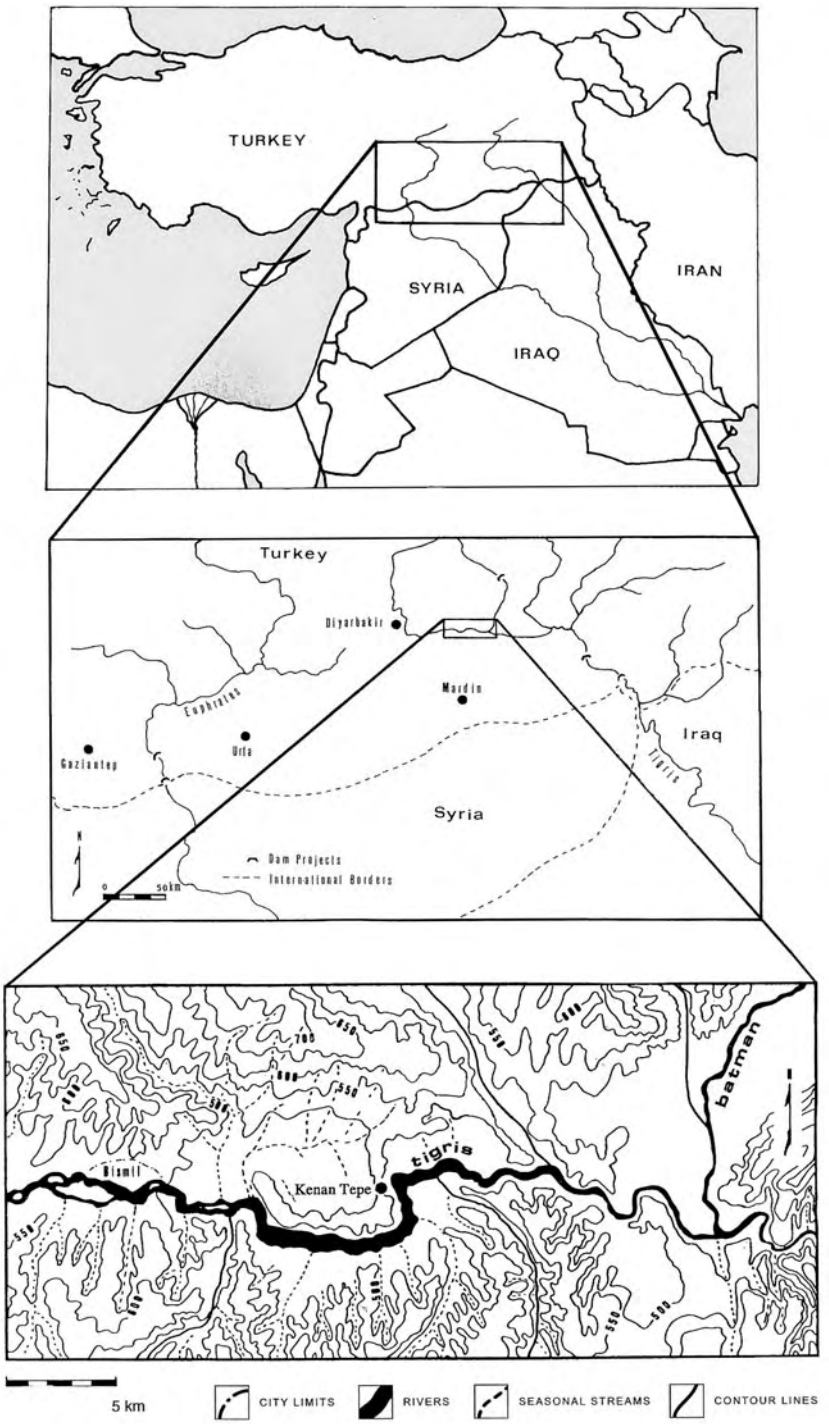


Figure 1. Map of the modern Middle East with enlargements showing southeastern Turkey, the Upper Tigris River valley and the location of Kenan Tepe.

Figure 2. View of Kenan Tepe facing north from the Tigris River.

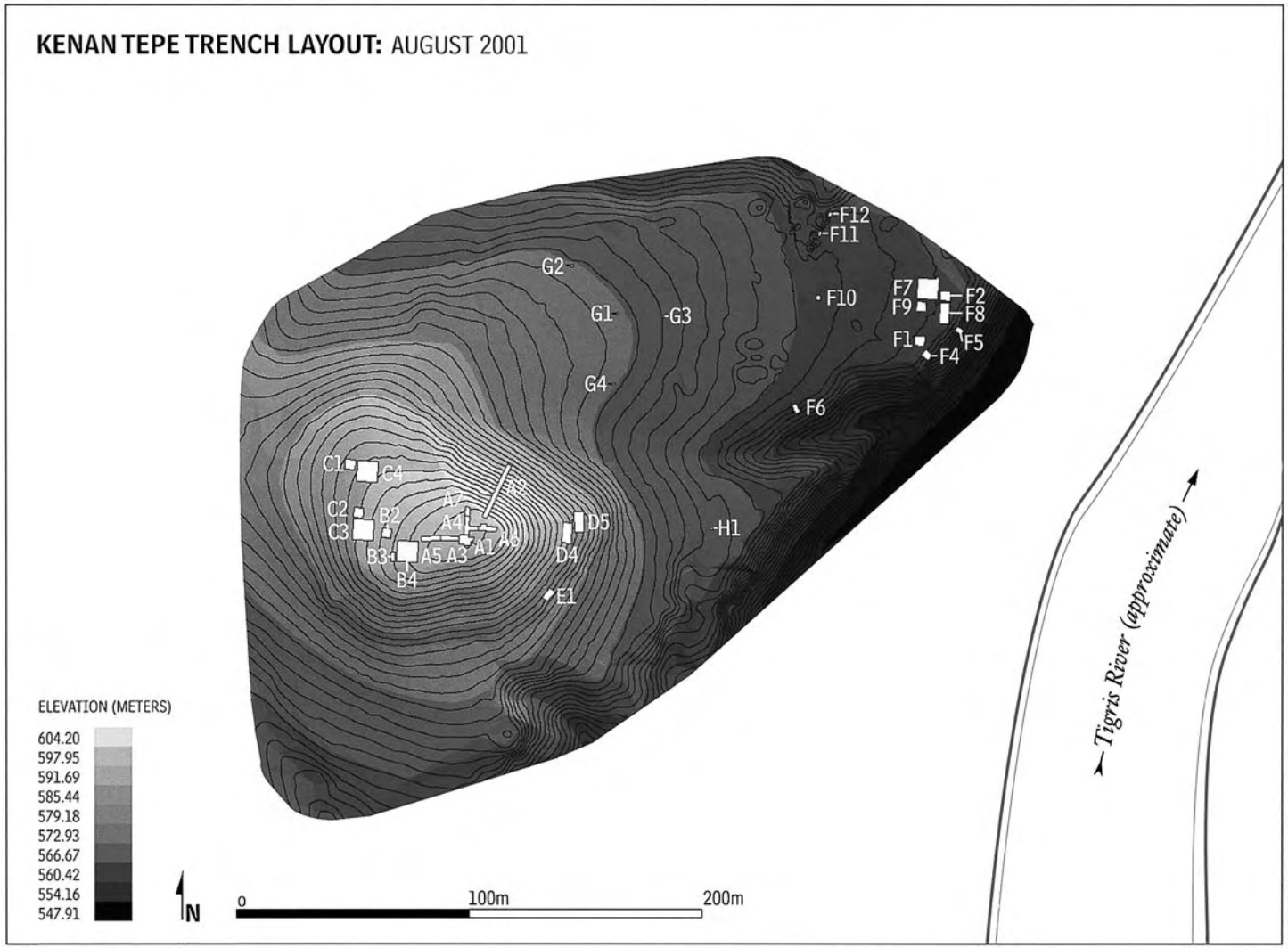


Figure 3. Topographic map of Kenan Tepe showing the location of various excavation areas.

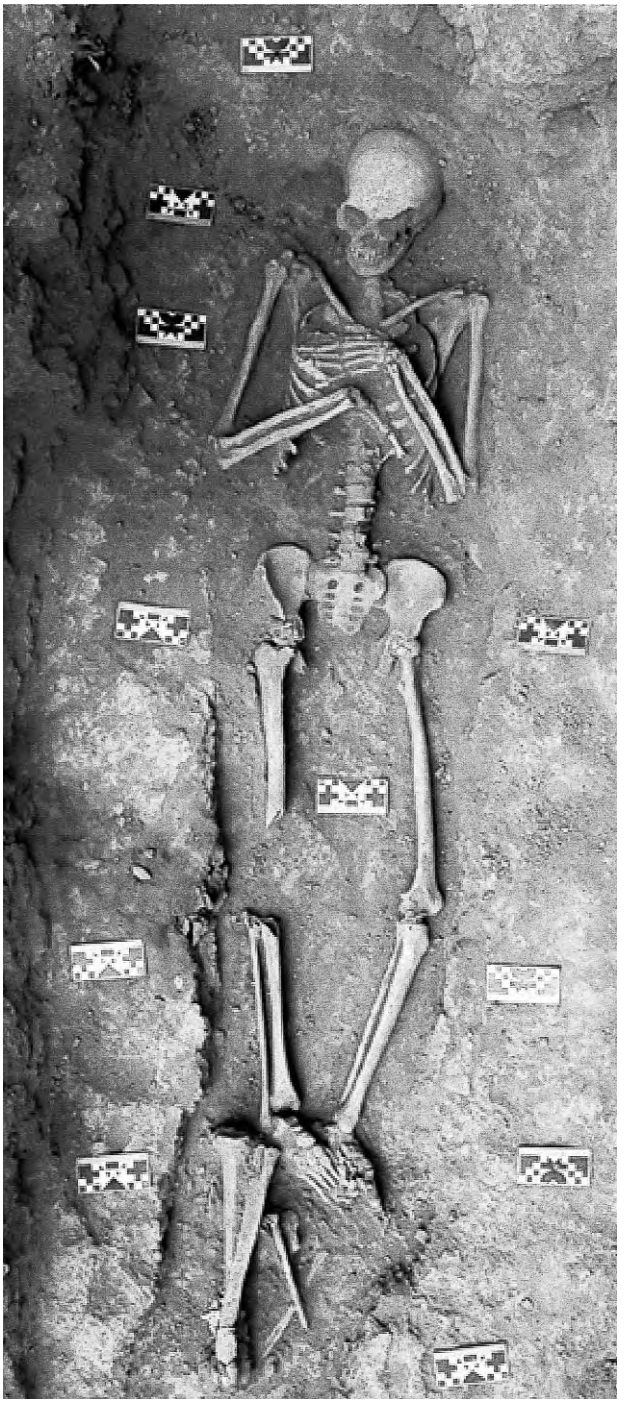


Figure 4. Burial from Area A.

Figure 5. Burial from Area A. Note that the western portion of this burial has been disturbed.

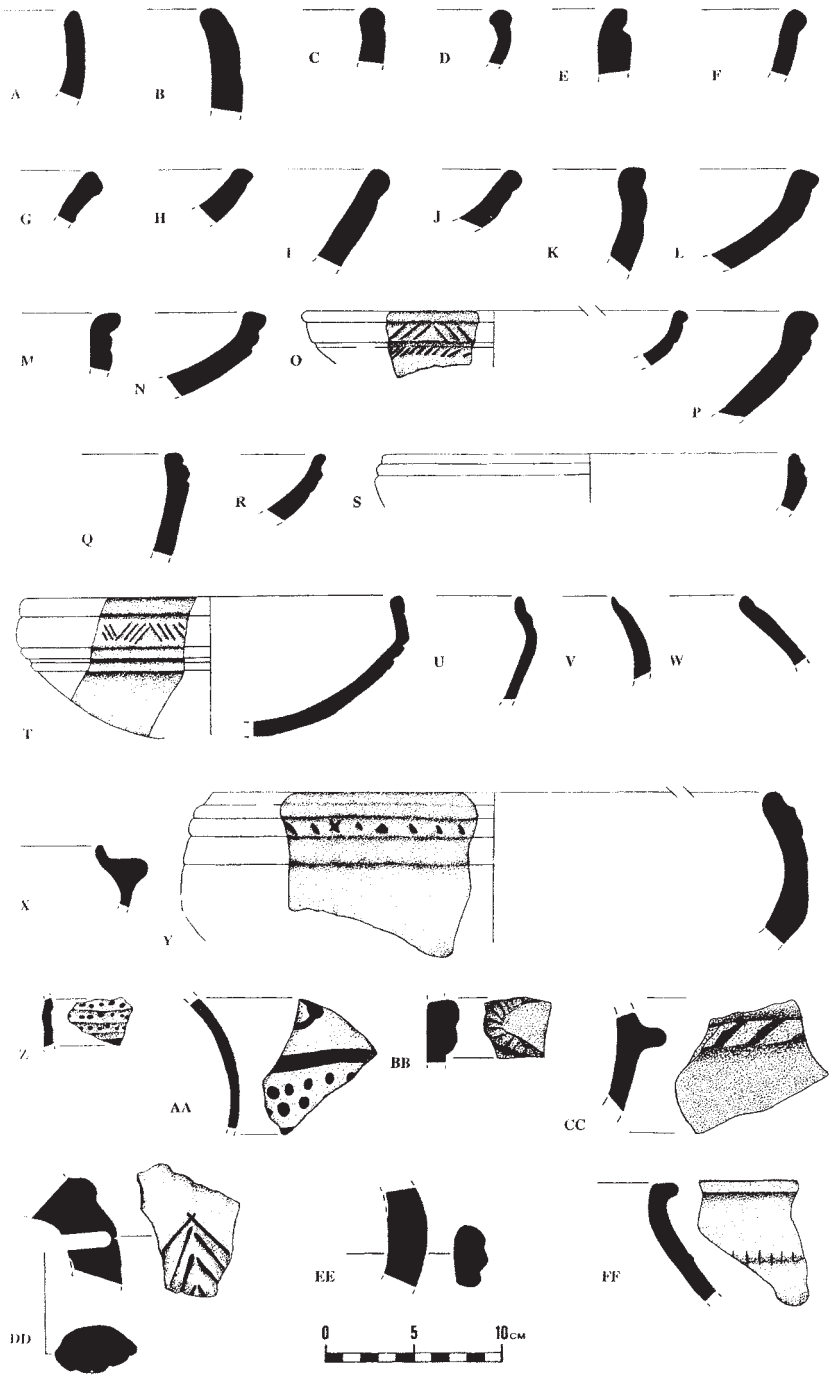


Figure 6. Early Iron Age ceramics from various contexts in Area B. This figure includes corrugated types (A-Y) and indigenous types such as the indigenous painted wares (Z and AA), "snake decoration" (BB) and the rope imitation band (CC).

Figure 6
Descriptions of Assorted Early Iron Age Ceramics

A. B1021 KT1110 #4: Surface exterior is light brownish gray (10YR 7/2), interior surface is light gray (10YR 7/2), core color is very pale brown (10YR8/4); fine chaff temper; 24 cm diameter.
B. B1021 KT1110 #13: Surface exterior is brown (7.5YR 6/4), interior surface is light brown (7.5 YR 4/3), core color is black (10YR 2/1); medium grit/chaff temper; 50 cm diameter.
C. B1021 KT1110 #12: Surface exterior is grayish brown (2.5Y 7/2), interior surface is light gray (2.5Y 5/2), core color is very pale brown (10YR 7/3); medium to coarse chaff temper; 42 cm diameter.
D. B1021 KT1110 #3: Surface exterior is pink (10YR 6/2), interior surface is light brownish gray (7.5YR 7/3), core color is dark gray (10YR 4/1); medium chaff temper; 17 cm diameter.
E. B1027 KT1189 #3: Surface exterior is reddish yellow wash (7.5YR 8/3), interior surface is pink (5YR 7/6), core color is light red (2.5YR 6/6); coarse chaff temper; 34 cm diameter.
F. B1027 KT1140 #10: Surface exterior is reddish yellow (5YR 6/4), interior surface is light reddish brown (5YR 7/6), core color is red (2.5YR 5/6); fine chaff temper; cm diameter is indeterminate.
G. B1021 KT1110 #2: Surface exterior is light brown (7.5YR 7/8), interior surface is reddish yellow (7.5YR 6/4), core color is brownish yellow (10YR 6/6); fone grit temper with very minor chaff inclusions; 54 cm diameter.
H. B1027 KT1189 #5: Surface exterior is a light brown wash (5YR 6/6), interior surface is reddish yellow (7.5YR 6/4), core color has an abrupt change from very pale brown (10YR 7/3) to very dark gray (5Y 3/1); coarse chaff temper; cm diameter indeterminate.
I. B1027 KT1140 #5: Surface exterior is pale red (2.5YR 7/4), interior surface is light reddish brown (10R 7/4), core color is light red (2.5YR 6/6); fine chaff temper; 27 cm diameter.
J. B4013 KT4179 #2: Surface exterior is strong brown (7.5Yr 6/4), interior surface is light brown (7.5YR 5/6), core color is yellowish brown (10YR 5/4); medium chaff temper; cm diameter is indeterminate.
K. B1021 KT1110 #8: Surface exterior is a burnished reddish yellow (5YR 7/6), interior surface has mild burnishing and is a reddish yellow (5YR 6/6), core color has a abrupt change from strong brown (7.5YR 5/6), to a very dark gray (7.5YR 3/1); medium grit/chaff temper, 49 cm diameter.
L. B1027 KT1140 #1: Surface exterior is pale red (10YR 7/3), interior surface is pale red (10R 6/3), core color is light red (10R 6/8); fine chaff temper; cm diameter is indeterminate.
M. B1027 KT 1140 #12: Surface exterior is light reddish brown (2.5YR 5/4) interior surface is reddish brown (2.5YR 6/4), core color is light red (10R 6/6); very fine chaff temper, cm diameter is indeterminate.
N. B1025 KT1130 #1: Surface exterior is pink (10YR 7/2), interior surface is light gray (7.5YR 7/4) core color is very dark gray (10YR 3/1); medium to coarse grit/chaff temper; cm diameter is indeterminate.
O. B1014 KT1057 #5: Surface exterior is pink (7.5YR 7/4), interior surface is pink (7.5YR 7/4), core color grades from pink (7.5YR 7/4) to brown (7.5YR 5/2); temper is indeterminate; 40 cm diameter.
P. B1012 KT1089 #1: Surface exterior is pink (5YR 7/4), interior surface is very pale brown (10YR 8/2), core color is reddish yellow (5YR 6/6); medium chaff temper, 20 cm diameter.
Q. B1014 KT1057 #3: Surface exterior is a burnished reddish yellow (7.5YR 7/6), interior surface

is a burnished reddish yellow (5YR 6/6), core color grades from reddish yellow (7.5YR 6/6) to grayish brown (10YR 5/2); coarse chaff temper; cm diameter is indeterminate.

R. B1027 KT1140 #2: Surface exterior is red (7.5R 6/6), interior surface is light red (7.5R 5/6), core color is light red (10R 5/6); medium chaff temper; 20 cm diameter.

S. B1014 KT1057 #4: Surface exterior is reddish yellow (5YR 6/6), interior surface is reddish yellow (5YR 6/6), core color is reddish yellow (5Yr 7/6); coarse chaff temper; 22 cm diameter.

T. B4013 KT4179 #1: Surface exterior is a burnished light brownish gray (7.5YR 5/4), interior surface is brown (10YR 6/2), core color has an abrupt change from strong brown (7.5YR 4/6) to brown (7.5YR 4/2); coarse grit temper, 20 cm diameter

U. B1012 KT1089 #2: Surface exterior is very pale brown (10YR8/4), interior surface is pink (7.5YR 7/4), core color is reddish yellow (5YR 6/6); medium chaff temper; cm diameter is indeterminate.

V. B1027 KT1140 #9: Surface exterior is pale red (10R 6/4), interior surface is pale red (10R 6/4), core color is light red (10R 6/6); fine chaff temper; 9 cm diameter.

W. B1027 KT1189 #2: Surface exterior is light reddish brown (5YR 6/6), interior surface is reddish yellow (5YR 6/3), core color is very dark gray (5Y 3/1); medium grit/chaff temper; cm diameter is indeterminate.

X. B1027 KT1140 #11: Surface exterior is light reddish brown (2.5 YR 6/3), interior surface is light reddish brown (2.5YR 6/4), core color is reddish brown (2.5YR 5/3); fine chaff temper; cm diameter is indeterminate.

Y. B1013 KT1078 #1: Surface exterior is a burnished light reddish brown (5YR 6/4), interior surface is brown (7.5YR 5/4), core color is reddish brown (2.5YR 5/4); medium to coarse grit temper; 50 cm diameter.

Z. B1014 KT1072 #1: Surface exterior is reddish yellow (5YR 6/6), interior surface is reddish yellow (5YR 6/6), core color is reddish yellow (5YR 6/6); no visible temper; body sherd.

AA. B4012 KT4163 #1: Surface exterior is pinkish gray (7.5YR 7/4), surface paint is reddish brown (5YR 4/4), interior surface is pink (7.5YR 7/2), core color is reddish yellow (7.5YR 6/6); fine to medium grit/chaff temper; body sherd.

BB. B1027 KT1140 #6: Surface exterior is light reddish brown (2.5YR 6/3), interior surface is light reddish brown (2.5YR 7/3), core color is weak red (10YR 4/3); fine chaff temper; body sherd.

CC. B1035 KT117 #5: Surface exterior is light brown (7.5YR 6/3), interior surface is light brown (7.5YR 6/4), core color is black (2.5Y 2.5/1); medium chaff temper; body sherd.

DD. B1027 KT1140 #3: Surface exterior is light reddish brown (2.5YR 6/3), interior surface is light reddish brown (2.5YR 7/3), core color is reddish brown (5YR 6/6); coarse chaff temper; handle.

EE. B1027 KT1140 #4: Surface exterior is light red (2.5YR 6/6), interior surface is light red (2.5YR 6/6), core color is reddish brown (2.5YR 5/2); medium chaff temper; handle.

FF. B1027 KT1140 #8: Surface colors and temper information is unavailable; cm diameter is indeterminate.

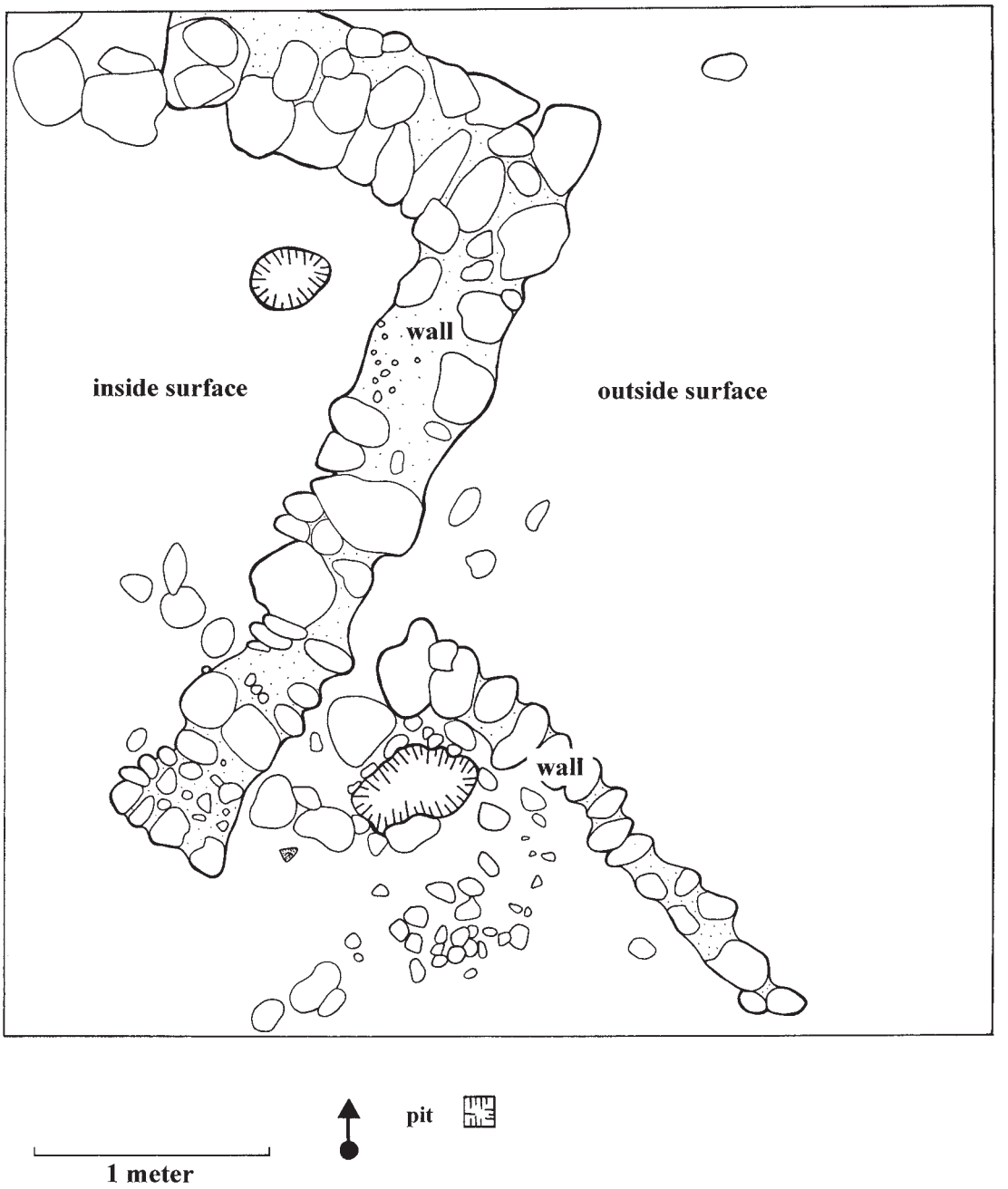


Figure 7. Plan of trench C2 showing architecture dating to the early second millennium B.C.

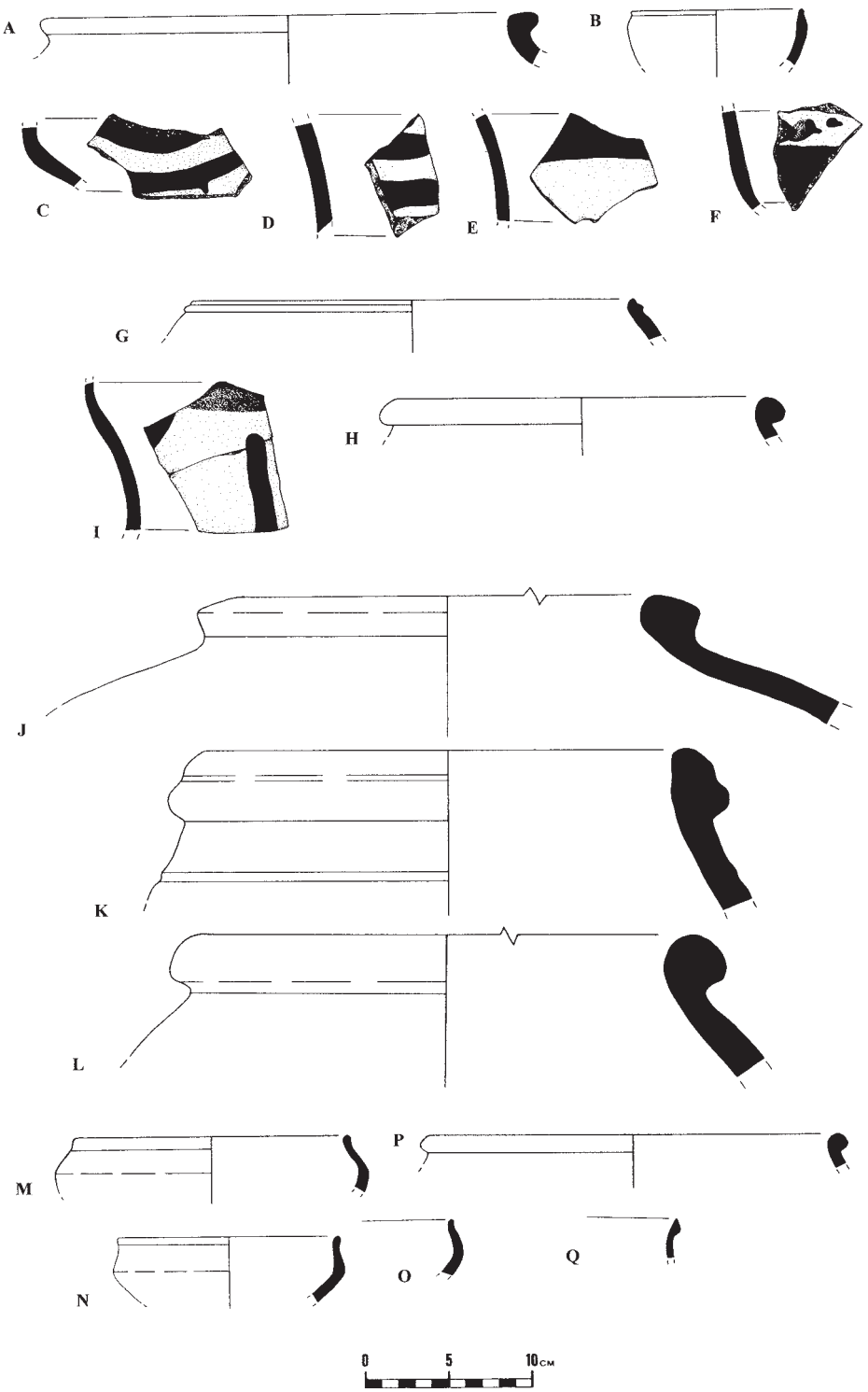


Figure 8. Ceramics belonging to the Red-Brown Wash Ware corpus from trench C2.

Figure 8
Description of Assorted Early Second Millennium Ceramics from Trench 2

A. C2 L2070 KT2476 #6: Light reddish brown exterior surface (7.5YR 7/3) grading to a pink core (7.5YR 7/4). Pink interior surface (5YR 6/4). Medium grit and chaff temper.
B. C2 L2070 KT2476 #1: Gray exterior surface (2.5Y 3/1) grading to a black core (5Y 2.5/1). Very dark gray interior surface (10YR 5/1). Wash on exterior surface. Medium grit and chaff temper.
C. C2 L2070 KT2476 #5: Light gray exterior surface (10YR 7/2). Light yellowish brown fabric (10YR 6/4) grading to a light gray core (2.5Y 7/2). Light gray interior surface (10YR 7/2). Brown paint (7.5YR 4/3) on exterior surface. Medium grit and chaff temper.
D. C2 L2070 KT2476 #2: Reddish yellow exterior surface (5YR 7/4). Yellowish red fabric (5YR 6/8) abruptly changing to a reddish yellow core (5YR 6/6). Pink interior surface (5YR 6/6). Reddish brown paint (2.5YR 4/4) on exterior surface. Fine grit temper.
E. C2 L2070 KT2476 #3: Light brownish gray exterior surface (7.5YR 7/2) grading to a very dark gray core (10YR 3/1). Pinkish gray interior surface (10YR 6/2). Yellowish red paint (5YR 5/6) on exterior surface. Fine grit temper.
F. C2 L2070 KT2476 #4: Dark grayish brown exterior surface (10YR 7/2) grading to a brownish yellow core (10YR 6/6). Light gray interior surface (10YR 4/2). Brown paint (7.5YR 4/2) on exterior surface. Very fine grit temper.
G. C2 L2073 KT2519 #3: Pink exterior surface (5YR 5/6). Reddish yellow fabric (7.5YR 7/6) grading to a light olive brown core (2.5Y 5/4). Yellowish red interior surface (7.5YR 7/4). Pink wash (5YR 5/6) on exterior surface. Medium chaff temper.
H. C2 L2073 KT2519 #4: Dark reddish gray exterior surface (5YR 4/2) grading to a brown core (7.5YR 5/4). Dark reddish gray interior surface (5YR 4/2). Coarse grit temper.
I. C2 L2073 KT2519 #1 and #2: Grayish brown exterior surface (2.5Y 7/2). Dark grayish brown fabric (2.5Y 4/2) grading to a dark gray core (2.5Y 4/1). Light gray interior surface (2.5Y 5/2). Reddish brown paint (2.5YR 4/4) on exterior surface. Burnished exterior surface. Fine grit temper.
J. C2 L2084 KT2568 #1: Reddish yellow exterior surface (5YR 6/6) grading to a very dark gray core (GLEY1 3/N). Dark gray interior surface (GLEY1 4/N). Red paint in the groove of the rim (2.5YR 5/6). Medium grit and chaff temper. Cmd. 36
K. C2 L2084 KT2589 #1: Pink exterior surface (7.5YR 7/4). Reddish yellow fabric (7.5YR 7/6) abruptly changing to a very dark gray core (10YR 3/1). Pink interior surface (7.5YR 7/4). Medium chaff temper.
L. C2 L2084 KT2589 #2: Very pale brown surface (10YR 7/4) grading to a dark gray core (2.5Y 4/1). Very pale brown interior surface (10YR 7/4). Medium chaff temper.
M. C2 L2084 KT 2568 #3: Reddish-yellow surface (5YR 6/6) that continues through to the core. Pale yellow wash on interior surface (5Y 8/3). Medium grain chaff temper.
N. C2 L2084 KT 2568 #2: Very pale brown exterior surface (10YR 7/4) grading to light yellowish brown core (2.5Y 6/4). Pale brown interior surface (10YR 6/3). Fine grit temper.
O. C2 L2084 KT 2568 #5: Reddish yellow exterior surface (5YR 6/6) grading to yellowish red core (5YR 5/6) with abrupt transition to very dark gray (GLEY1 3/N). Reddish yellow interior surface (5YR 6/6). Medium grain chaff temper. Cmd. unknown.C2 L2084 KT 2568 #4: Light gray surface (10YR 7/2) grading to light brown core (7.5YR 6/4). Reddish yellow interior surface (5YR 6/6) Reddish brown paint on the top edge of the rim (2.5YR 5/4). Fine chaff temper.
P. C2 L2084 KT2589 #4: Light gray surface (10YR 7/2) grading to brown core (7.5YR 6/4). Reddish yellow interior surface (5YR 6/6). Reddish brown paint on the top edge of the rim (2.5YR 5/4). Fine chaff temper.
Q. C2 L2084 KT2589 #3: Pink exterior surface (7.5YR 8/4) grading to a brown core (7.5YR 5/4). Pink interior surface (7.5YR 7/4). Medium grit temper.

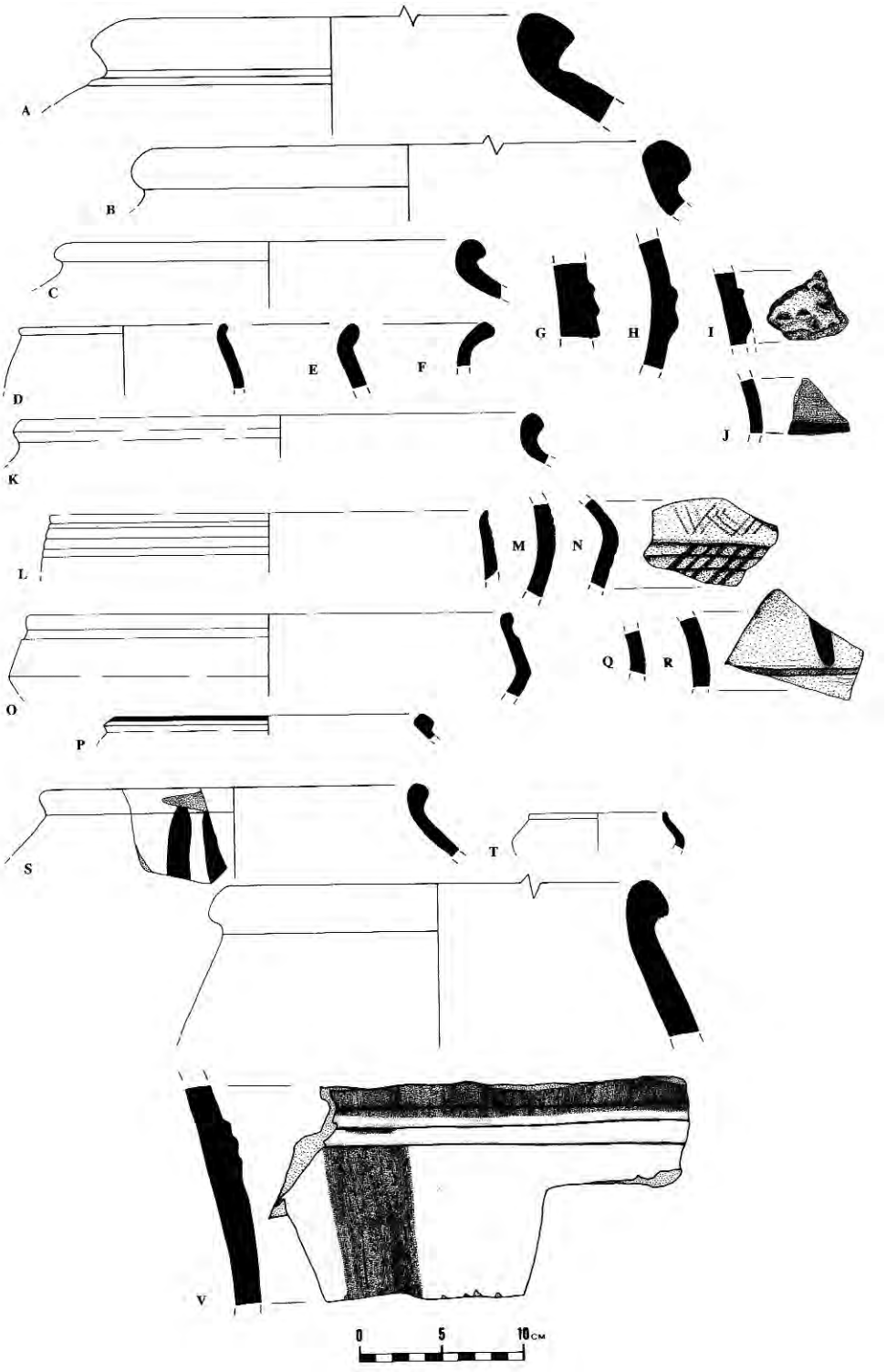


Figure 9. Ceramics belonging to the Red-Brown Wash Ware corpus from trench D4.

Figure 9
Descriptions for Assorted Early Second Millennium Ceramics from Trench D4

A. D4 L4032 KT4154 #7: Reddish brown exterior surface (7.5YR 8/4) grading to a very dark gray core (5Y 3/1). Pink interior surface (5YR 4/4). Medium chaff temper.
B, D4 L4032 KT4180 #7: Pink exterior surface (7.5YR 7/6). Very pale brown fabric (10YR 7/4) grading to a dark gray core (10YR 4/1). Reddish yellow interior surface (7.5YR 8/4). Medium grit and chaff temper.
C. D4 L4032 KT4180 #8: Yellowish red exterior surface (5YR 5/6). Strong brown fabric (7.5YR 4/6) abruptly changing to a black core (10YR 2/1). Yellowish red interior surface (5YR 5/6). Very coarse grit temper.
D. D4 L4032 KT4154 #1: Pink exterior surface (5YR 6/6). Reddish yellow fabric (5YR 6/6) abruptly changing to a gray core (GLEY1 5/N). Reddish yellow interior surface (7.5YR 6/4). Red paint (2.5YR 4/6) on exterior surface. Medium to coarse grit temper.
E. D4 L4032 KT4154 #2: Dark grayish brown exterior surface (7.5YR 7/4). Very pale brown fabric (10YR 8/4) grading to a very dark gray core (2.5Y 3/1). Pink interior surface (2.5Y 4/2). Fine grit temper.
F. D4 L4032 KT4154 #3: Strong brown exterior surface (7.5YR 5/3). Brown fabric (10YR 5/3) grading to a dark gray (2.5Y 4/1). Brown interior surface (7.5YR 4/6). Medium chaff temper.
G. D4 L4032 KT4154 #14: Reddish gray exterior surface (2.5YR 6/6). Light red fabric (2.5YR 6/1) abruptly changing to a dark gray core (GLEY1 4/N). Light red interior surface (2.5YR 5/1). Incised bands on exterior surface. Medium chaff temper.
H. D4 L4032 KT4154 #8: Pale brown exterior surface (7.5YR 7/4). Reddish yellow fabric (7.5YR 7/6) abruptly changing to a very dark gray core (2.5Y 3/1). Pink interior surface (10YR 6/3). Incised on exterior surface. Fine chaff temper.
I. D4 L4032 KT4154 #6: Pink exterior surface (7.5YR 6/4) grading to a pinkish yellow core (7.5YR 6/5). Pink interior surface (7.5YR 6/4). Impressed decorations on exterior surface. Medium grit temper.
J. D4 L4032 KT4154 #13: Light red exterior surface (7.5YR 6.5/4). Reddish yellow fabric (5YR 6/6) grading to a gray core (5YR 5/1). Light pinkish brown interior surface (2.5YR 6/6). Interior badly corroded. Red band of paint (2.5YR 5/6) on exterior of the upper edge of the sherd.
K. D4 L4032 KT4154 #9: Light brown exterior surface (7.5YR 7/3). Light yellowish brown fabric (10YR 6/4) abruptly changing to a very dark gray core (2.5Y 3/1). Pink interior surface (7.5YR 6/3). Wash on exterior surface. Burnished on exterior surface. Medium to coarse grit temper.
L. D4 L4032 KT4154 #10: Pink exterior surface (7.5YR 8/3). Very pale brown fabric (10YR 8/4) grading to a pale brown core (10YR 6/3). Pink interior surface (7.5YR 7/4). Incised bands on exterior surface. Fine grit temper.
M. D4 L4032 KT4154 #11: Dark brown exterior surface (5Y 8/2). Pale yellow fabric (5Y 7/3) grading to a light gray core (10YR 7/2). Pale yellow interior surface (7.5YR 3/2). Incised with very dark gray paint (5Y 3/1) on exterior surface. Fine grit temper.
N. D4 L4032 KT4180 #4: Very pale brown exterior surface (10YR 8/3). Reddish yellow core (7.5YR 6/6). Pale yellow interior surface (10YR 8/3). Dark yellowish brown paint (10YR 4/4) on exterior surface. Medium grit temper.

O. D4 L4032 KT4154 #5: Pale yellow exterior surface (10YR 7/3). Yellow fabric (10YR 7/6) abruptly changing to a very dark gray core (5Y 3/1). Very pale brown interior surface (2.5Y 7/3). Burnished interior and exterior surfaces. Fine chaff temper.

P. D4 L4032 KT4180 #3: Pink exterior surface (7.5YR 8/4) grading to a reddish yellow core (7.5YR 8/6). Pink interior surface (7.5YR 8/4). Reddish brown paint (2.5YR 4/4) on the rim. Very fine grit temper.

Q. D4 L4032 KT4154 #12: Brown exterior surface (10YR 7/2) grading to a pale yellow core (2.5Y 8/3). Light gray interior surface (7.5YR 5/2). Incised bands on exterior surface. Medium grit temper.

R. D4 L4032 KT4180 #2: Pale yellow exterior surface (2.5Y 8/2). Reddish yellow fabric (7.5YR 7/8) grading to a dark grayish brown core (10YR 4/2). Pale yellow interior surface (2.5Y 8/3). Incised on exterior surface. Brown paint (7.5YR 4/2) on exterior surface. Fine grit temper.

S. D4 L4030 KT4211 #1: Pink exterior surface (7.5YR 7/4) grading to a reddish yellow core (5YR 7/6). Pink interior surface (7.5YR 7/4). Burnished exterior with a reddish brown painted surface (2.5YR 5/4). Fine grit temper.

T. D4 L4030 KT4211 #2: Very pale brown exterior surface (10YR 7/4) grading to a black core (2.5Y 2.5/1). Light gray interior surface (10YR 7/2). Very pale brown wash on exterior surface (10YR 7/4). Medium grit and chaff temper.

U. D4 L4030 KT4211 #3: Pink exterior surface (7.5YR 7/4). Reddish yellow fabric (7.5YR 8/6) grading to a dark gray core (10YR 4/1). Reddish yellow interior surface (7.5YR 5/6). Pink wash on exterior surface (7.5YR 7/4). Coarse chaff temper.

V. D4 L4019 KT4087 #1: Very pale brown exterior surface (10YR 7/4) grading to a very dark gray core (10YR 3/1). Pink interior surface (5YR 7/4). Strong brown paint on exterior surface (7.5YR 5/6). Medium grit temper.

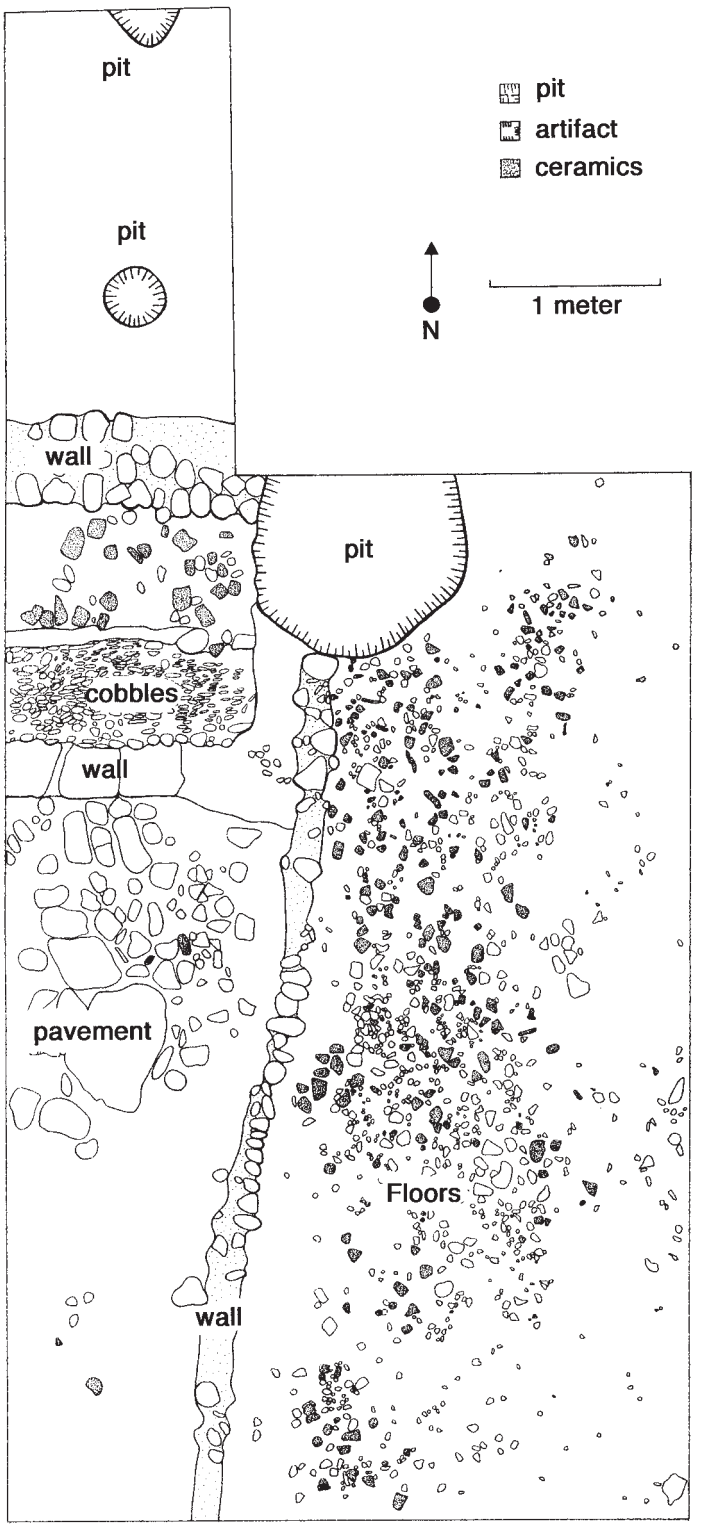


Figure 10. Plan of trench D4 showing architecture dating to the early second millennium B.C.

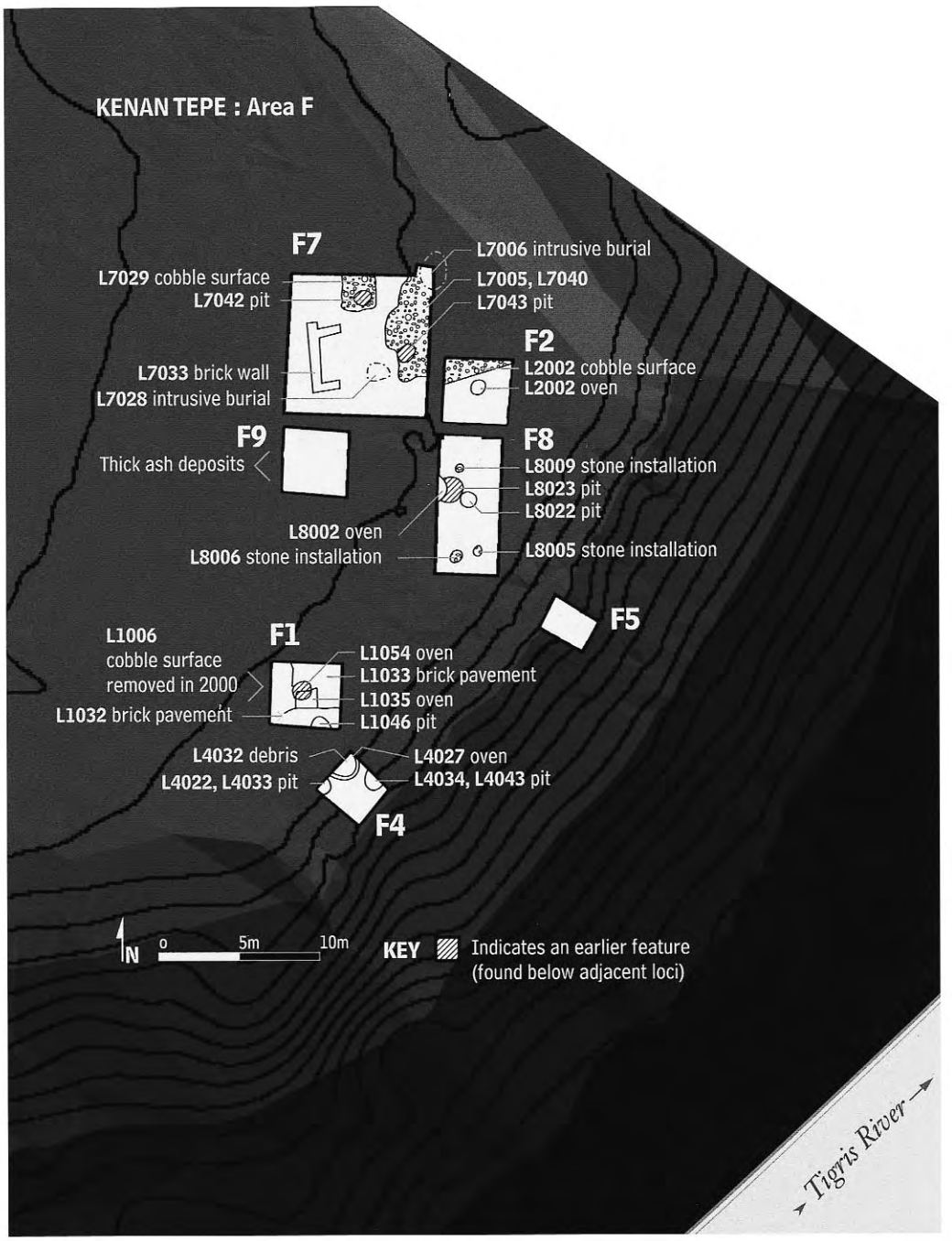


Figure 11. Plan of Area F trenches.

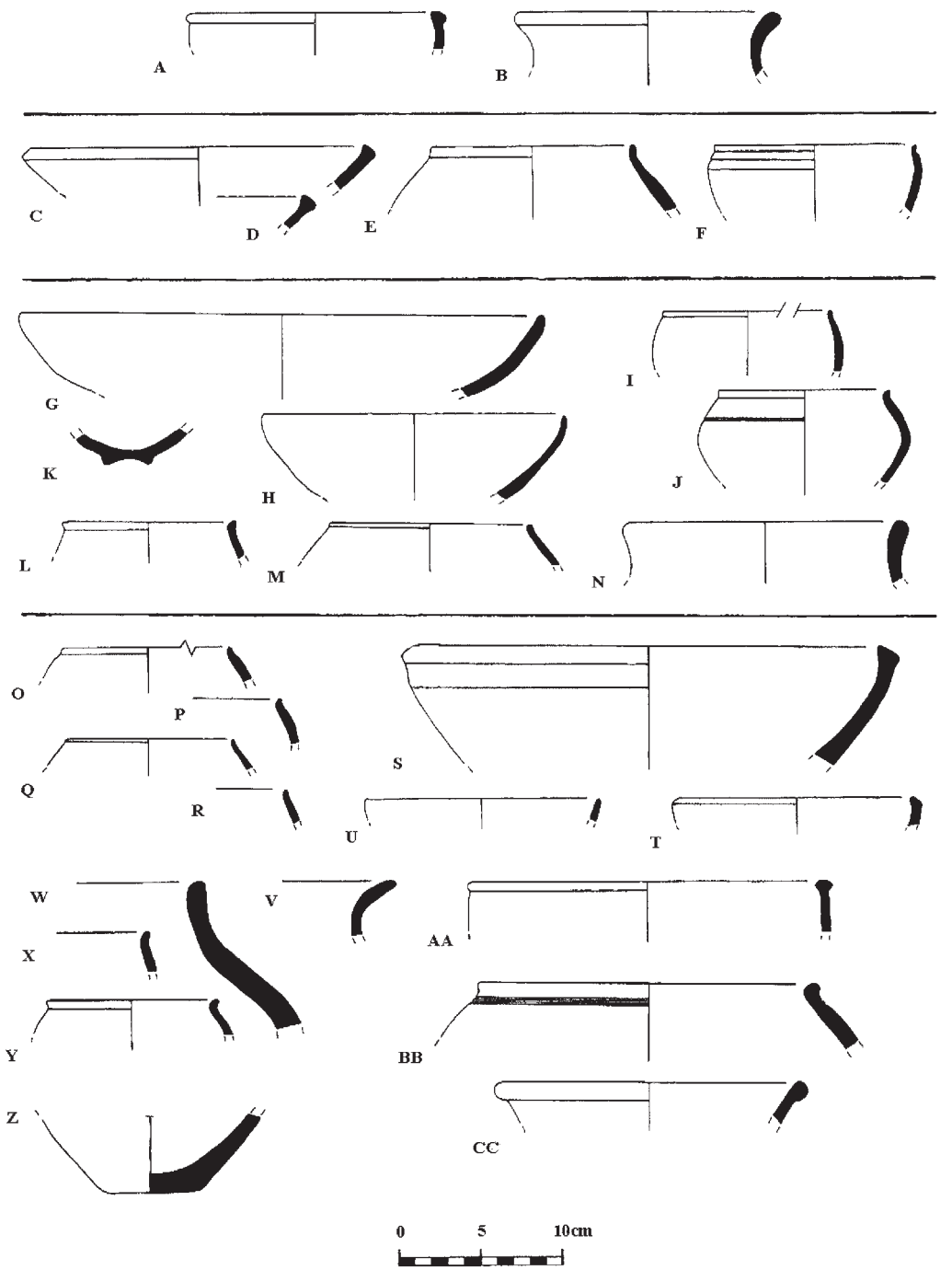


Figure 12. A sample of Late Chalcolithic ceramics from oven/kiln (L4009/L4027) in trench F4. These ceramics come from four sealed, superimposed loci within this feature and are bracketed by four carbon-14 dates (see table 2).

Figure 12
Descriptions for Late Chalcolithic Ceramics from Trench F4

A. F4 L4004 KT4047 #1: Reddish yellow exterior surface (5YR 6/6) grading to a reddish yellow core (5YR 7/6). Reddish yellow interior surface (5YR 6/6). Burnished exterior. Fine grit temper.B.

B. F4 L4004 KT4047 #2: Light brown exterior surface (7.5 YR 6/4). Pink fabric (7.5YR 7/4) abruptly changing to a black core (10 YR 2/1). Pink interior surface (7.5YR 7/4). Medium chaff temper.

C. F4 L4005 KT4062 #2: Pink exterior surface (7.5 YR 6/3) abruptly changing to a pinkish gray core (7.5YR 6/2). Light brown interior surface (7.5YR 7/4). Pink wash on exterior surface (7.5YR 6/3). Fine chaff temper.

D. F4 L4005 KT4062 #6: Reddish yellow exterior surface (5YR 5/6) grading to a reddish yellow core (5YR 6/6). Reddish yellow interior surface (5YR 6/6). Reddish yellow wash on exterior surface (5YR 5/6). Pink paint on exterior surface (5YR 7/4). Very coarse chaff temper. Cmd. unknown.

E. F4 L4005 KT4062 #4: Reddish yellow exterior surface (5YR 7/3) grading to a reddish yellow core (5YR 6/6). Pink interior surface (5YR 6/6). Fine chaff temper.

F. F4 L4005 KT4062 #5: Reddish yellow exterior surface (5YR 6/6) grading to a yellowish red core (5YR 6/6). Reddish yellow interior surface (5YR 7/6). Reddish yellow wash on exterior surface (5YR 6/6). Very coarse chaff temper.

G. F4 L4007 KT4086 #2: Reddish yellow exterior (10 YR 7/4). Red fabric (2.5YR 5/6) abruptly changing to a reddish yellow core (7.5YR 7/6). Very pale brown interior surface (5YR 6/6). Reddish yellow wash on exterior surface (10YR 7/4). Medium grit temper.

H. F4 L4007 KT4086 #1: Reddish yellow exterior surface (5 YR 6/6) grading to a reddish yellow core (5 YR 6/8). Reddish yellow interior surface (7.5 YR 7/6). Non-visible temper.

I. F4 L4007 KT4065 #2: Reddish yellow exterior surface (7.5 YR 6/6) grading to a reddish yellow core (7.5 YR 7/6). Reddish yellow interior surface (5 YR 6/6). Fine grit temper. Cmd. unknown.

J. F4 L4007 KT4077 #1: Reddish yellow exterior surface (5 YR 6/4) grading to a light brown core (7.5 YR 6/4). Light reddish brown interior surface (5 YR 6/6). Fine grit temper.

K. F4 L4007 KT4086 #5: Light brown exterior surface (10YR 7/4) grading to a yellowish brown core (10YR 5/4). Very pale brown interior surface (7.5YR 6/4). Medium grit temper.

L. F4 L4007 KT4065 #1: Light brown exterior surface (7.5 YR 6/4) grading to a light reddish brown core (7.5 YR 6/4). Light brown interior surface (7.5 YR 6/3). Light brown wash on exterior surface (7.5 YR 6/4). Fine grit temper.

M. F4 L4007 KT4086 #3: Pale brown exterior surface (10YR 7/3) grading to a dark gray core (10YR 4/1). Very pale brown interior surface (10YR 6/3). Medium grit temper.

N. F4 L4007 KT4086 #4: Light brown exterior surface (10YR 5/3). Brown fabric (10YR 5/3) abruptly changing to a black core (10YR 2/1). Brown interior surface (7.5YR 6/4). Light brown wash on exterior surface (10YR 5/3). Burnished on interior and exterior surfaces. Coarse chaff temper.

O. F4 L4023 KT4111 #2: Very pale brown exterior (10YR 6/4). Yellow fabric (10YR 8/6) grading to a dark gray core (10YR 6/1). Light yellowish brown interior surface (10YR 7/3). Medium grit temper.

P. F4 L4023 KT4202 #2: Reddish yellow exterior surface (5YR 6/6). Reddish yellow core (5YR

6/6). Reddish yellow interior surface (5YR 6/6). Fine chaff temper. Cmd. unknown.

Q. F4 L4023 KT4217 #2: Reddish yellow exterior surface (7.5YR 7/6). Reddish yellow core (7.5YR 7/6). Reddish yellow interior surface (7.5YR 7/6). Burnished exterior. Fine grit temper.

R. F4 L4023 KT4202 #4: Pink exterior surface (7.5YR 7/3). Pink fabric (7.5YR 7/4) abruptly changing to a pink core (7.5YR 7/3). Pink interior surface (7.5YR 7/4). Fine grit temper. Cmd unknown.

S. F4 L4023 KT4202 #1: Pink exterior surface (10YR 6/6). Reddish yellow fabric (7.5YR 6/6) grading to a strong brown core (7.5YR 5/6). Very pale brown interior surface (7.5YR 7/4). Fine chaff temper.

T. F4 L4023 KT4111 #4: Pink exterior surface (7.5YR 6/4) grading to a reddish yellow core (7.5YR 6/6). Light brown interior surface (7.5YR 7/4). Fine grit and chaff temper.

U. F4 L4023 KT4217 #1: Reddish yellow exterior surface (7.5YR 7/4) grading to a reddish yellow core (5YR 7/6). Pink interior surface (5YR 7/6). Fine grit temper.

V. F4 L4023 KT4111 #1: Reddish yellow exterior surface (7.5YR 6/4) grading to a reddish yellow core (7.5YR 6/6). Light brown interior (7.5YR 6/6). Burnished exterior. Very coarse grit temper.

W. F4 L4023 KT4251 #1: Pink exterior surface (7.5YR 6/6). Light brown fabric (7.5YR 6/4) abruptly changing to a black core (7.5YR 2.5/1). Reddish yellow interior surface (7.5YR 7/3). Burnished exterior. Fine grit and chaff temper. Cmd. unknown.

X. F4 L4023 KT4202 #3: Reddish yellow exterior surface (5YR 5/6) grading to a yellowish red core (5YR 5/6). Yellowish red interior surface (5YR 6/6). Burnished exterior. Fine grit temper. Cmd. unknown.

Y. F4 L4023 KT4251 #2: Reddish yellow exterior surface (7.5YR 6/6) grading to a strong brown core (7.5YR 5/6). Reddish yellow interior surface. Fine grit and chaff temper.

Z. F4 L4023 KT4111 #6: Pink exterior surface (7.5YR 7/4). Pink core (7.5YR 7/4). Pink interior surface (7.5YR 7/4). Coarse chaff temper.

AA. F4 L4023 KT4111 #5: Reddish yellow exterior (7.5YR 7/4) grading to a reddish yellow core (5YR 6/6). Pink interior surface. Fine grit temper.

BB. F4 L4023 KT4111 #3: Yellowish red exterior surface (7.5YR 5/4). Brown fabric (7.5YR 3/3) grading to a yellowish red core (5YR 5/8). Brown interior surface (5YR 5/6). Yellowish red wash on exterior surface (7.5YR 5/4). Double incised bands. Coarse grit temper.

CC. F4 L4023 KT4251 #3: Light brown exterior surface (5YR 6/6) grading to a yellowish red core (5YR 5/6). Reddish yellow interior surface (7.5YR 6/4). Light brown wash on exterior surface (5YR 6/6). Fine grit and chaff temper.

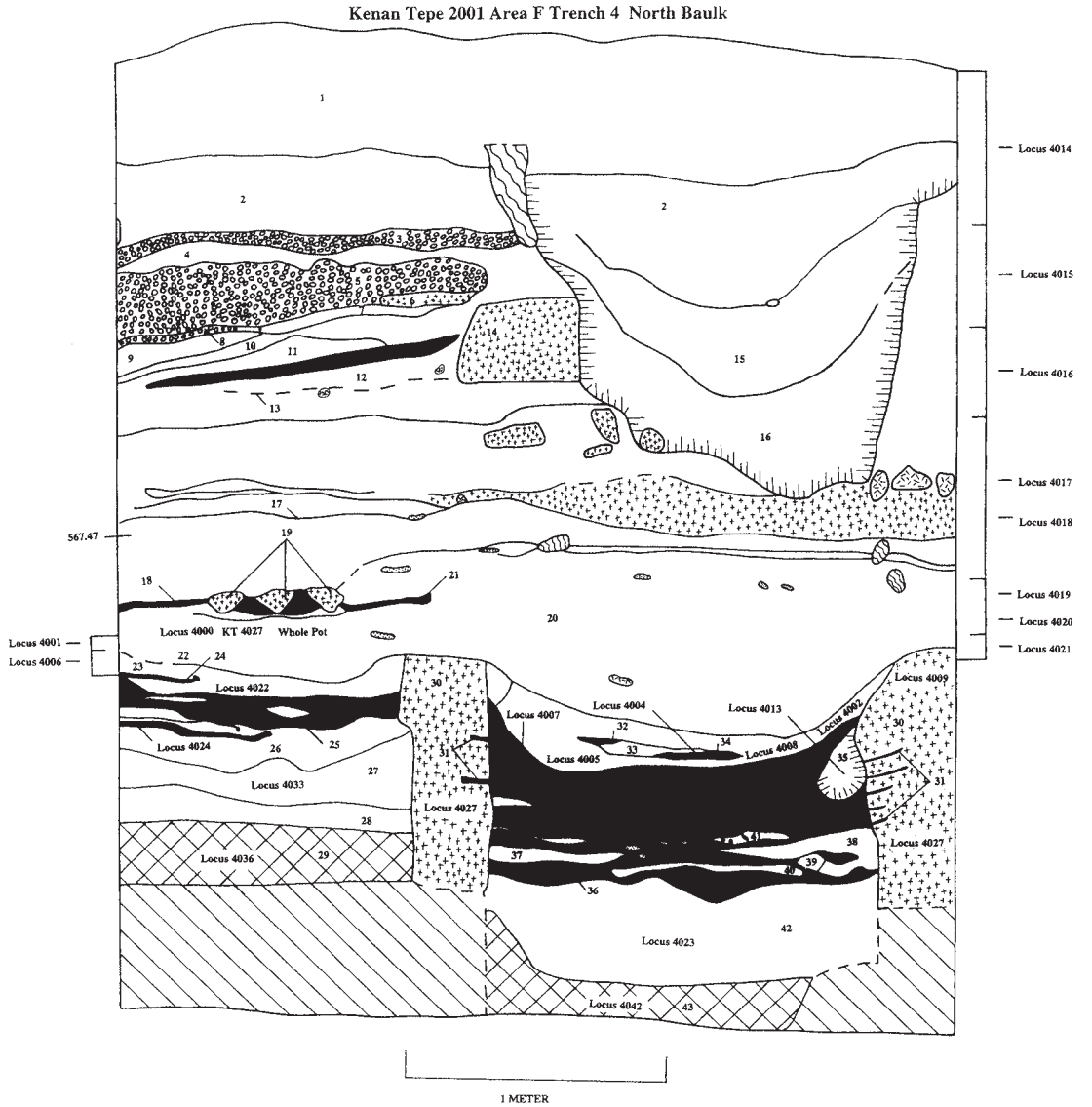
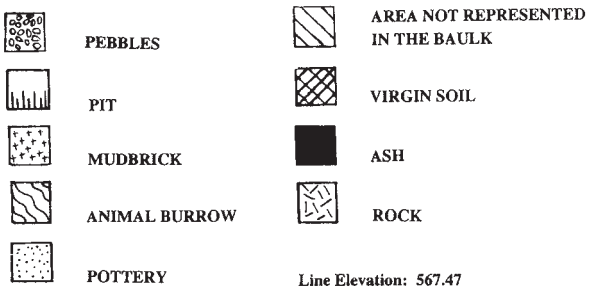


Figure 13. Trench F4 North Section. Note that the carbon dates come from L4004 and L4023.



*** WET Munsells**
(Otherwise, Munsells are natural Munsells)

1. Topsoil – Loosely packed angular grained soil. Light brownish gray.*
2. Subtopsoil – Brown with white flecks, darker inside the pit in the North-East area.*
3. Rock Surface – Mostly rocks along a straight line. Light brownish-red soil.*
4. Space between Surfaces – Light reddish-brown to darker reddish brown in hue.*
5. Larger Rock Surfaces – Larger cobbles on top, smaller cobbles on the bottom.
6. Mudbrick. Light gray.*
7. Medium gray soil between cobble layer and surface.*
8. Floor surfaces that become black ash.*
9. Light brown area.*
10. Strong Brown. 7.5YR 5/6.*
11. Strong Brown. 7.5YR 4/6.*
12. Light Gray fill between surfaces and ash layer.*
13. Very thin surface of pebbles in a line with small white plaster bits.
14. Mudbrick. Brown 7.5YR 5/4.*
15. Strong Brown. 7.5YR 4/6.*
16. Brown. 7.5YR 5/4.*
17. Possible surface.
18. Possible surface.
19. Mudbricks. Strong Brown 7.5YR 4/6.*
20. Light Gray – very hard layer that extends from the West to the East baulk. Very tightly packed. Comes off in jagged strips. Not easily troweled. Possibly brick.*
21. Lightly colored ash areas between bricks and leading to the bricks.
22. Clay. Very hard packed. Gray 5YR 6/1.
23. Clay. Hard packed. Light Brown 7.5YR 6/3.
24. Ash lens. Dark Gray 5YR 4/1.
25. Ash. Dark Gray 2.5Y 4/1.
26. Less dense ash deposition with medium packed clay matrix. 7.5YR 6/1 Gray.
27. Clay. Chunky, cracking layer. Pinkish Gray 5YR 6/2.
28. Clay. Pinkish Gray 5YR 7/2.
29. Virgin Soil. Pinkish Gray 7.5YR 7/2.
30. Mudbrick. Light Brown 7.5YR 6/4.
31. Mortar Line. PaleBrown 10YR 6/3.
32. Ash. Fine, soft. Dark Grayish Brown 10YR 4/2.
33. Ash with charcoal bits. Light Gray 10YR 7/1.
34. Ash/ Fine, soft. Very Dark Gray 7.5YR 3/1.
35. Ash. Pale Brown 10YR 6/3.
36. Ash with charcoal bits. Gray 10YR 5/1.
37. Clay-loam. Hard; of medium sort. Light Yellowish Brown 10YR 6/4
38. Clay-loam. Hard; of medium sort. Pale Brown 10YR 6/3.
39. Hard crumbly soil of very coarse texture. Light Yellowish Brown 10YR 6/4.
40. Clay. Crumbly; of medium sort. Pale Brown 10YR 6/3.
41. Ash with charcoal pieces. Gray 7.5YR 6/1.
42. Clay. Very hard. Light brown 7.5YR 6/3.
43. Virgin soil. Brown 7.5YR 5/3.

Description for Figure 13.

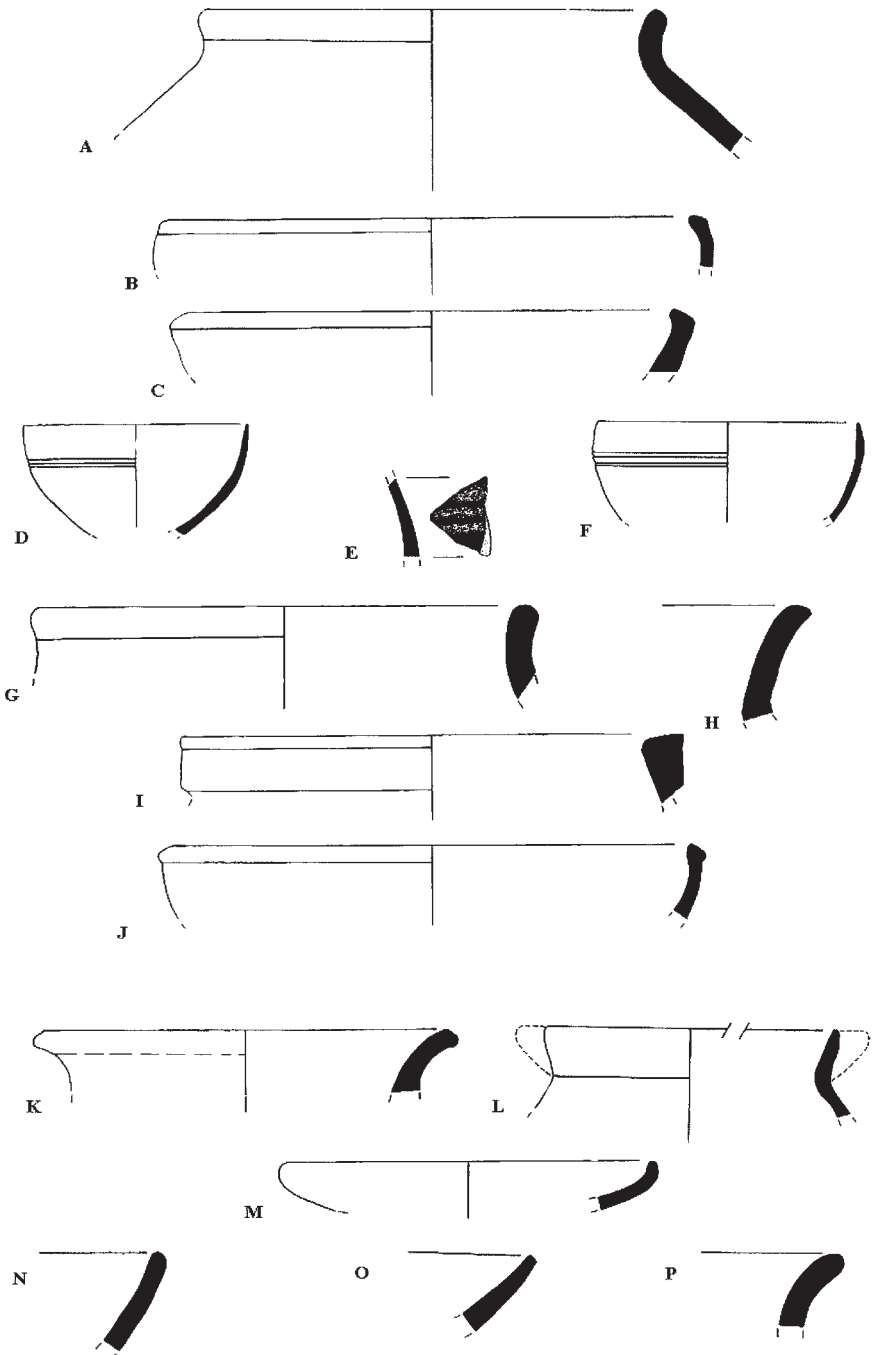


Figure 14. A sample of ceramics recovered from soundings in areas G and H.

Figure 14
Descriptions for Assorted Ceramics from Soundings G and H

A. G4 L4007 KT4013 #9: Light brown exterior surface (7.5YR 6/3) grading to a brown core (7.5YR 5/4). Light brown interior surface (7.5YR 6/4). Coarse grit and chaff temper.
B. G4 L4007 KT4013 #6: Light brown exterior surface (7.5YR 6/4) grading to a reddish yellow core (5YR 6/6). Reddish yellow interior surface (7.5YR 6/6). Fine grit temper.
C. G2 L2002 KT2005 #2: Light brown exterior surface (7.5YR 6/4). Strong brown fabric (7.5YR 5/6) abruptly changing to a dark brown core (7.5YR 3/2). Light brown interior surface (7.5YR 6/4). Very fine grit temper.
D. G4 L4007 KT4013 #7: Very pale brown exterior surface (10YR 8/4) grading to a yellow core (10YR 8/6). Very pale brown interior surface (10YR 8/4). Incised band on exterior surface. Fine grit temper.
E. G4 L4007 KT4013 #3: Very pale brown exterior surface (10YR 7/4) grading to a yellowish brown core (10YR 5/4). Light brown interior surface (7.5YR 6/3). Medium grit temper. Cmd. unknown.
F. G4 L4007 KT4013 #4: Pink exterior surface (7.5YR 7/3) grading to a light brown core (7.5YR 6/4). Light brown interior surface (7.5YR 6/4). Incised band on exterior surface. Very fine grit temper.
G. G4 L4007 KT4013 #8: Very pale brown exterior surface (10YR 8/2). Reddish yellow fabric (5YR 6/6) abruptly changing to a very dark gray core (5Y 3/1). Reddish yellow interior surface (5YR 7/8). Very coarse chaff temper.
H. G4 L4007 KT4013 #2: Light yellowish brown exterior surface (10YR 6/4). Light yellowish brown fabric (10YR 6/4) abruptly changing to a dark bluish gray core (GLEY 23/5b). Light yellowish brown interior surface (10YR 6/4). Coarse chaff temper. Cmd. unknown.
I G2 L2002 KT2005 #1: Light brown exterior surface (7.5YR 6/4) grading to a dark grayish brown core (10YR 4/2). Light brown interior surface (7.5YR 6/4). Light brown wash on exterior surface ((7.5YR 6/4). Fine grit and chaff temper.
J. G4 L4007 KT4013 #5: Reddish yellow exterior surface (7.5YR 6/6). Reddish yellow fabric (7.5YR 6/6) abruptly changing to a dark brown core (7.5YR 3/2). Light brown interior surface. Fine to medium chaff temper
K. H1 L1002 KT1006 #3: Light gray exterior surface (10YR 7/2). Yellow core (10YR 8/6) grading to a dark olive gray core (5Y 3/2). Very pale brown interior surface (10YR 7/3). Burnished exterior and interior surfaces. Medium to coarse chaff temper.
L. H1 L1002 KT1006 #5: Pink exterior surface (7.5YR 7/4) grading to a light yellowish brown core (10YR 6/4). Pink interior surface 7.5YR 7/4). Coarse grit and chaff temper. Cmd. unknown.
M. H1 L1002 KT1006 #4: Yellowish red exterior surface (5YR 5/6) grading to a strong brown core (7.5YR 5/6). Reddish yellow interior surface (5YR 6/6). Burnished interior surface. Fine grit temper.
N. H1 L1002 KT1006 #2: Light reddish brown exterior surface (5YR 6/4) grading to a dark yellowish brown core (10YR 4/6). Reddish brown interior surface (5YR 5/4). Medium chaff temper. Cmd. unknown.
O. H1 L1002 KT1006 #1: Light brown exterior surface (7.5YR 6/4) grading to a yellowish brown core (10YR 5/4). Pink interior surface (7.5YR 7/4). Burnished interior and exterior surface. Coarse chaff temper. Cmd. unknown.
P. H1 L1002 KT1006 #6: Light reddish exterior surface (5YR 6/4) grading to a reddish yellow core (5YR 6/6). Reddish yellow interior surface (5YR 7/6). Burnished exterior surface. Coarse grit temper. Cmd. unknown.

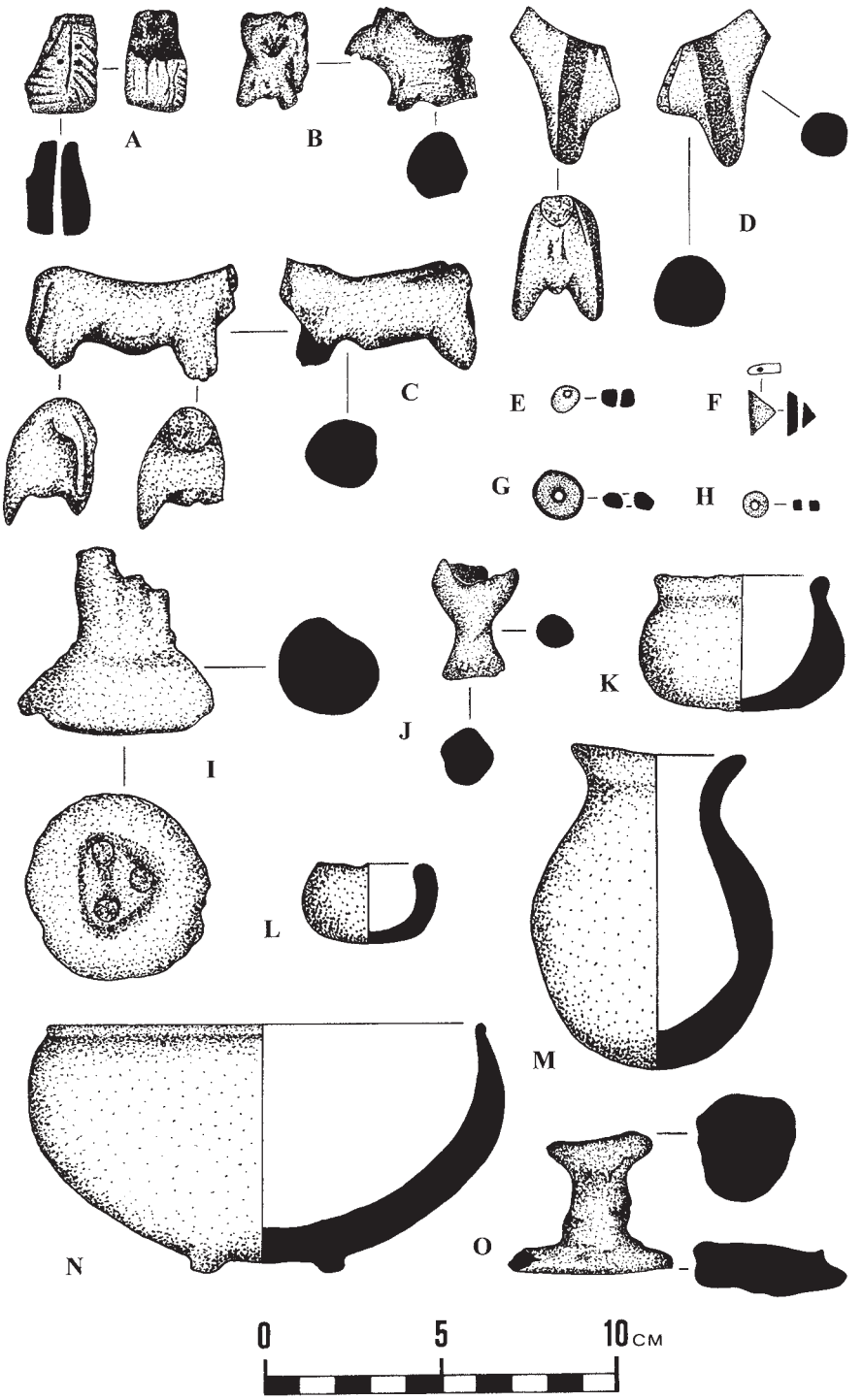


Figure 15. Small finds from various contexts at Kenan Tepe.

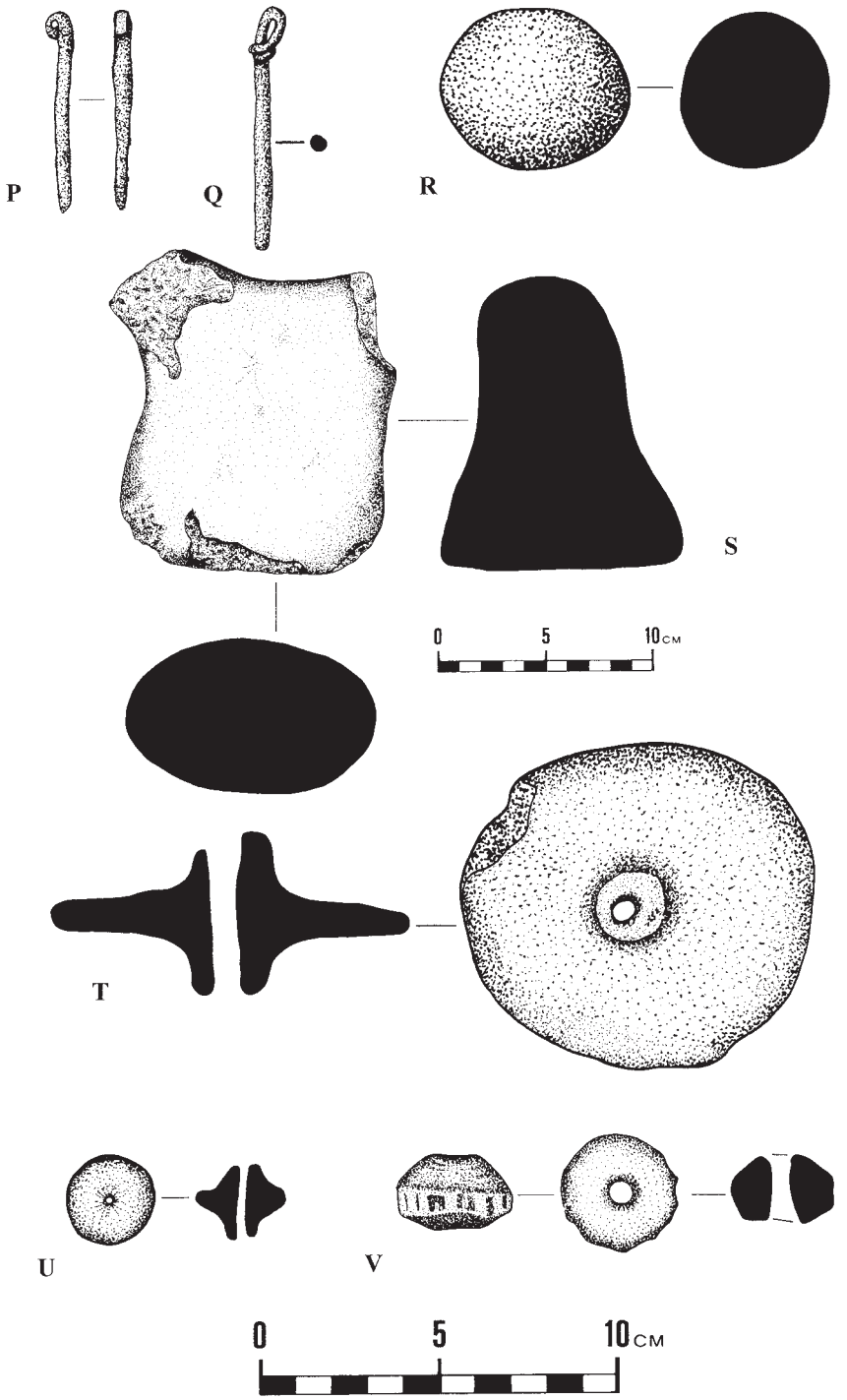


Figure 16. Small finds from various contexts at Kenan Tepe.

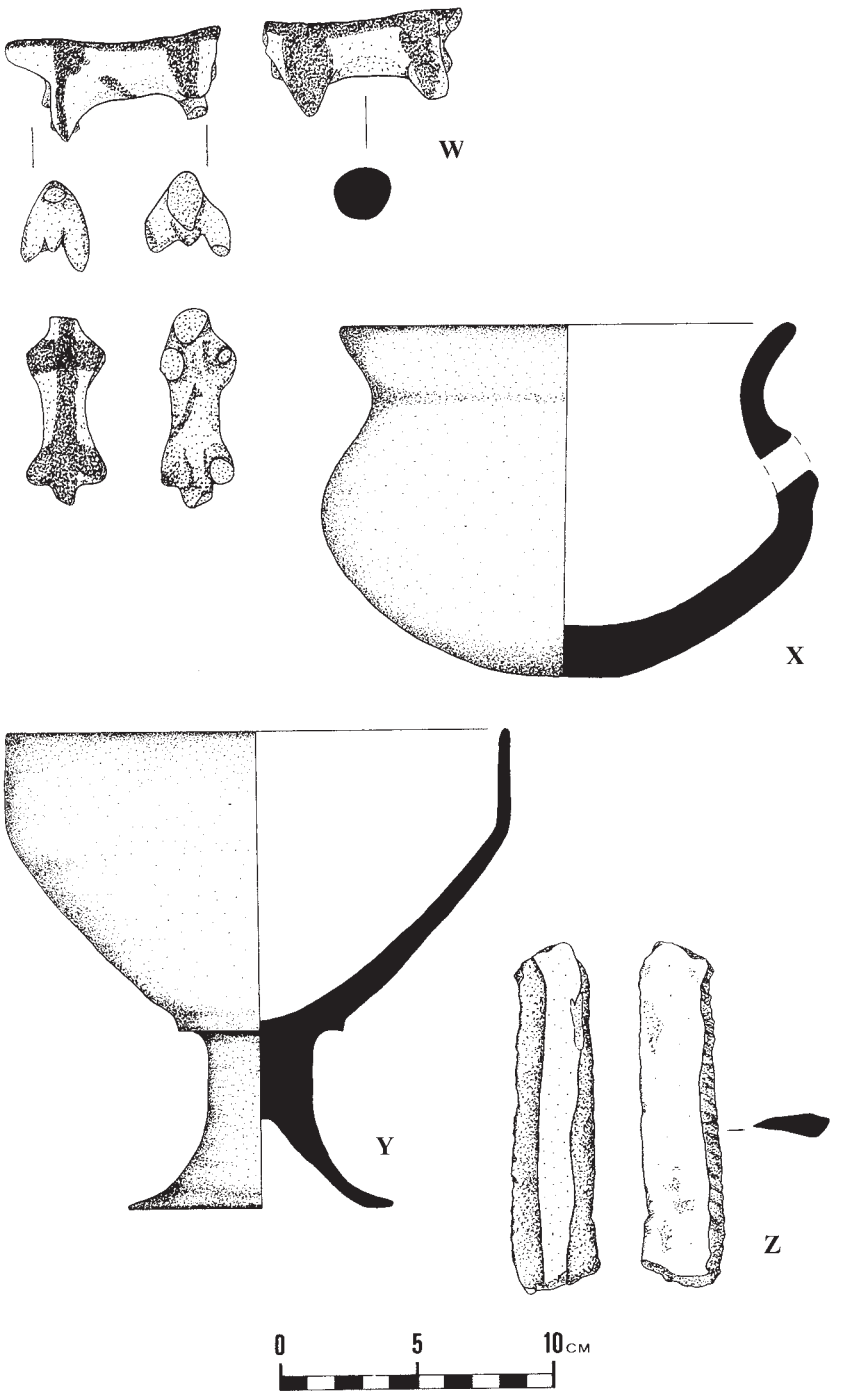


Figure 17. Small finds from various contexts at Kenan Tepe.

ANATOLICA XXIX, 2003

ARCHAEOLOGICAL INVESTIGATIONS AT ZIYARET TEPE – 2002

Timothy Matney, John MacGinnis, Helen McDonald, Kathleen Nicoll, Lynn Rainville, Michael Roaf, Monica L. Smith and Diana Stein

This report describes archaeological excavation and geophysical prospection at the site of Ziyaret Tepe in the Diyarbakır Province of southeastern Turkey and regional geomorphological survey within the Upper Tigris River valley between Diyarbakır and Batman conducted during the late summer of 2002. The overall project director was Dr. Timothy Matney (University of Akron) who also oversaw excavations in Operation A and subsurface geophysical survey on the high mound and lower town. Excavations were directed by Prof. Michael Roaf (University of Munich, Operation E), Dr. John MacGinnis (University of Cambridge, Op. G) and Dr. Monica Smith (University of California—Los Angeles, Operation J). The regional geomorphological survey was directed by Dr. Kathleen Nicoll (University of Oxford). Prof. Simo Parpola (University of Helsinki), the project epigrapher, joined the team toward the end of the season to copy and translate the cuneiform tablets found in Operation G of the lower town.[1]

The goals of the 2002 season were: (1) to continue defining a sequence of well-stratified materials spanning the entire occupational history of the site, focusing on the Middle Assyrian period remains near the top of the sequence and the early second millennium BC and earlier levels in the Operation E step trench; (2) to document the architectural sequence of construction in a Late Assyrian monumental public building, possibly a palace, identified previously in Operation A and to determine the nature of deposits beneath that building; (3) to expand excavation of a well-preserved Late Assyrian structure in Operation G in the lower town to complete a plan of the structure

[1] We would like to acknowledge the assistance of the Ministry of Culture, Department of Monuments and Museums in securing permits for the 2002 field season. Our work was supported locally by Necdet Inal, the director of the Diyarbakır Museum, and his staff, by Numan Tuna, the director of TAÇDAM and by Ahmet Çelebi, the mayor of nearby Tepe. Mr. Nizamettin Kara from the Ankara Ethnographic Museum served as our government representative for the excavation portion of the project, while Mr. Recep Okçu of the Bursa Museum acted in a similar capacity for the geomorphological survey. Funds were provided by: the National Geographic Society, the National Science Foundation, the American Research Institute in Turkey, the British School of Archaeology in Iraq, the University of Oxford Wainwright Fund, the British Institute of Archaeology in Ankara, the University of Cambridge McDonald Institute for Archaeological Research, the British Academy and the University of Akron.

Assyrian structure in Operation G in the lower town to complete a plan of the structure and an inventory of its contents; (4) to explore possible Roman-period remains in the lower town previously recovered via surface survey in Operation J; (5) to complete the magnetic field gradiometry survey of the entire 32 hectare settlement initiated in the 1998-1999 seasons and (6) to begin a detailed geomorphological description and reconstruction of the paleoenvironment of the Upper Tigris region. During the 2002 season progress was made towards the completion of all six of these goals. Analyses of samples and processing of data from the excavations is on-going and the material presented in this report should be considered preliminary in nature.

The organization of this report follows the six project goals as outlined above. First, after a brief introduction to the site, reports on excavations in Operations E, A, G and J are given. Significant small finds and ceramics are described within the relevant excavation sections. These are followed by short reports on the microdebris analysis and the lithics from the excavations. Then, the magnetic field gradiometry data collected in 2002 is described and interpreted. Finally, a brief report on the methods and results of the geomorphological and paleoenvironmental surveys, with notes on proposed future exploration, concludes this article.

ZIYARET TEPE AND ITS ENVIRONS

Located within the Diyarbakır province of southeastern Turkey, Ziyaret Tepe is a thirty-two hectare mounded settlement along the right bank of the Tigris River floodplain between the modern cites of Bismil and Batman [Fig. 1]. The high mound at Ziyaret Tepe is located within the area to be flooded by the Ilısu hydroelectric dam (projected completion date is 2014), as part of the on-going Turkish economic development of the region under the GAP initiative. One of the largest ancient sites in the Ilısu salvage area, Ziyaret Tepe has a long occupational history from at least the Early Bronze Age (c. 3000 BC) through the Islamic period, including urban phases during the Late Bronze and Iron Ages, c. 1300-600 BC (Matney et al. 2002).

Ziyaret Tepe and its neighboring archaeological sites are located within the broad alluvial plain carved by the Tigris River as it flows through Miocene-Pliocene tablelands composed of limestone, shale, and conglomerate bedrock. This region has been paramount during antiquity because it is located along a major confluence of routes connecting the Syro-Mesopotamian lowlands with the Anatolian highlands of the Taurus to the north. The scenery alternates between hills (c. 600m above m.s.l.) and wide, open plateaux (c. 540m above m.s.l.) that are commonly irrigated for cultivation in the present day. The topography probably reflects the underlying rocks: conglomerates, limestones and young basalt caprock are more resistant to erosion in this climate.

In the present day, this part of southeastern Turkey has hot summers and cold winters with an average annual rainfall of about 580mm which falls almost exclusively in

the winter months (Türkeş et al. 2002) and is enough to sustain a vegetation typical of the Oro-Mediterranean and steppe forest (Roberts and Wright 1993). Today the natural flora of the area has been perturbed by farming of crops, including cotton and potatoes, which require intensive irrigation efforts within the Tigris Valley.

Ziyaret Tepe consists of a high mound and a surrounding lower town [Fig. 2]. The high mound is located at the northern edge of the site and rises twenty-two meters above the surrounding terrain and is approximately three hectares in area; it has relatively steep sides and a deep ravine on the northern edge, near its northeastern corner. An extensive lower town spreads out twenty-nine hectares to the west, south and east of the high mound. The lower town is generally flat and has been used extensively for dry farming for centuries. A slight rise at the southern edge of the site marks the line of an ancient city wall, as mapped using subsurface gradiometry (see Matney and Somers 1999, and text below). Likewise, the western edge of the lower town is delimited by a drainage (*wadi*), and the eastern edge by a more moderate slope, both bounding the maximum extension of the lower city.

Operation E

Excavations continued in the Operation E step trench on the east side of the high mound in 2002 [see Fig. 2 for location of the step trench]. The work was directed by Dr. Michael Roaf of the Institut für Vorderasiatische Archäologie in the University of Munich, assisted by Diana Stein, Çiğdem Maner, and Ratko Krvavac. The work was financed by the Deutsche Forschungsgemeinschaft as part of the research project "The northern frontiers of Mesopotamia," which also includes the excavations at the nearby site of Giricano Tepe. In the 2002 campaign, the excavations were concentrated in two areas: at the top of the step trench in the grid square N1080 E1180 (with smaller exposures in squares N1090 E1180 and N1080 E1190), and at the bottom where the step trench was extended towards the base of the high mound.

The Middle Assyrian and Later Remains

At the top directly below the surface of the mound various features were uncovered [Fig. 3]. Three circular pits c. 1.8m to 2.4m in diameter, two of which (E-205 and E-212) had been partly investigated in 2001 (Matney et al. 2002: Fig. 22), were excavated. These appear to have been grain storage pits, and may date to the medieval occupation of the site. In addition, four smaller pits c. 0.8 to 1.0m in diameter may also date to the same period. One of these was lined with stones and another with clay or mud-brick; the function of these lined pits is unknown. The northern wall of the well-built building found in previous seasons (Matney et al. 2002: Fig. 22 walls E-237, E-208, and E-013) was identified. The western side of this building was destroyed by erosion, and a southern extension of the building was much damaged by later pits and foundation

trenches. These building remains consisted of walls two mud-bricks wide (each c. 34-36cm square) set in foundation trenches. The associated floor levels were not preserved, being eroded from the top of the mound. The bottom of the foundation trenches stepped up about 0.8m to the west and to the south from their deepest level (wall E-237). The southern part of this building seemed to be cut by the north-west corner of the foundations of a second building again with walls two bricks wide constructed of similar sized mud-bricks. Seven courses of the foundation were identified, but the associated floor levels were not preserved. We have not yet been able to establish whether these structures belong to late in the Middle Assyrian period or are later (i.e. Early Iron Age or early Late Assyrian).

Stratigraphically below these features, there are a series of external erosion surfaces excavated in the northwestern quarter of square N1080 E1180. From one of these pebble and sherd surfaces (ZT6545; E-244) came a fragmentary Middle Assyrian cylinder seal (Fig. 4 discussed below in the section entitled Operation E Cylinder Seals by Diana Stein) and from others, a tanged leaf-shaped bronze arrowhead (ZT6467; E-248) and a bronze finger ring (ZT7639; E-252). The pottery in these surfaces included typical Middle Assyrian sherds, but at the moment we cannot tell if they were formed during or after the end of the Middle Assyrian occupation at Ziyaret Tepe. The erosional surfaces extend over the top of a structure partly excavated in 2001 (Matney et al. 2002: Fig. 22, walls E-211 and E-234), the southern wall of which was investigated in 2002. This structure was terraced into the earlier remains on the west and east and part of the associated floor to the east was excavated. The pottery associated with these features dates to the Middle Assyrian period.

Cut by this terraced structure are a series of walls belonging to rectangular buildings running on a slightly different alignment (just west of north). These walls belong to at least two architectural phases and preliminary investigations have revealed well preserved floors with in some cases complete vessels *in situ* and pebble-paved alleyways between the structures. The details of the plans of the structures are not yet clear, but it should be possible in a future season to investigate profitably the Middle Assyrian occupation on a wider scale in this area.

The Third Millennium BC Remains

The investigations down the slope extended the 5m wide trench to the east of Steps 5 and 6 (Matney et al. 2002: Fig. 20). In Step 5 in 2001 we had found a destruction level that we called the Brightly Burned Building. Judging from the pottery [see below the discussion by Helen McDonald, Figs. 5-8] and its parallels with Middle Bronze Age pottery from Üçtepe and Giricano this building probably dates to the first centuries of the second millennium BC (Sevin 1992; Schachner et al. 2002: Fig. 12.1). The presence of Dark Rimmed Orange Bowls in Step 6 (some 6m below the surface at the top of

Operation E) suggests that these layers belonged to the later centuries of the third millennium BC (Oates et al. 2001: 161-2; Lebeau 2000: 176-7 and 188, Table V).
A further five steps (Steps 7 to 12) were excavated in 2002 each 2.5m wide from E1202.5 to E1217.5. These covered some 8m of archaeological deposits (from an elevation of 559.5m to 551.5m above m.s.l.). Since the surface sloped greatly and the surface layers were contaminated by wash, animal burrows, and other disturbances it was decided to excavate this part of Operation E quickly and not to waste time forlornly attempting to distinguish the details of the stratigraphy. Instead the deposits were removed in artificial layers and the sections examined and drawn so that in the following season we can recover a closely stratified sample of finds from this part of the step trench. Four major building levels could be distinguished, which are separated from each other by thick layers of wash and external surfaces. Since the exposure of each phase is small and little material can be securely associated with each phase the precise stratigraphic sequence and the dating of the various features are uncertain.

The few datable finds including an excised Ninevite 5 sherd (probably a late local imitation), fragments of burnished pedestal bowls, sherds with reserved slip, and a "Burnt Steatite" cylinder seal (ZT3635, E-323) found in the lowest step [Fig. 4] suggest that the whole of this part of the step trench dates to the third millennium BC. Other finds include a limestone macehead (ZT7579; E-317), a bone pin (ZT3639; E-323) and two cylinder seal impressions (ZT3642 and ZT3674, both E-323) one on a jar sealing and the other perhaps a bag sealing.

The pottery from the lower part of Operation E has not yet been studied in detail. A surprising amount of the pottery is of a rather coarse handmade chaff-tempered ware. A number of these sherds have surfaces decorated with fingernail impressions or stab marks. A few sherds have reserved slip and incised decoration suggesting an early third millennium BC date. We have not yet reached virgin soil, which may still be more than 5m below the levels we were excavating in 2002, but it is likely that most of the pottery identified as late Neolithic or early Chalcolithic in the initial surface survey of Ziyaret Tepe in fact belongs to this third millennium horizon, and that the site was first extensively settled in the Early Bronze Age (Matney 1998: 11, 15, 17, Fig. 4.1-3). The total absence of bevelled rim bowl sherds amongst the pottery recovered from the site so far supports the idea that there was no occupation of the site in the Late Uruk period since bevelled rim bowls have been found at other sites in the region such as Çattepe (Velibeyoğlu et al. 2002: Fig. 39.1-6) and Giricano (pers. comm. A. Schachner).

Two Cylinder Seals from Operation E

Two cylinder seals from Operation E were studied in 2002 by Dr. Diana Stein. One is a Middle Assyrian seal (ZT 6545, E-244) and the other is an Early Bronze Age seal (ZT3635, E-323). Both were found in the Operation E excavations and are illustrated in Fig. 4. Below is a discussion of their iconography and dating.

ZT 6545, Locus E-244
Middle Assyrian Cylinder Seal
Description: Cylinder seal. A bucking ibex with a thick curved ridged horn beside the faint outline of a globular shaped tree with a straight trunk. Above the animal's back, the indistinct outline of a round symbol, most likely a crescent and star or a rosette.
Material: Whitish grey material, probably "faience".
Dimensions: 32 x 22 mm (length of impression x max height of impression/seal), d.10 mm, perforation 3.5 - 3.0 mm at break
Condition: A diagonal break has removed the lower part of the design. The seal surface is worn and the impression, therefore, low in relief and faint.
Findspot: Locus E-244 in square N1080 E1180.
Context: The cylinder seal lay on a sloping pebble and sherd surface in association with Middle Assyrian pottery.
Date: Late 13th century BC (Tukulti-Ninurta I) on the grounds of context and style.

Provenanced Comparanda:
Assur: Moortgat 1942: Abb. 27 and 54
Tell Fakhariyah: Kantor 1958: XXIV
Emar/Meskéné: Beyer 2001: Pl. L: G5
Tell al Rimah: Parker 1977: no. 37
Unprovenanced Comparanda:
Porada 1948: no. 601E

Comparisons to the Ziyaret seal come from Assur, Tell al-Rimah, Emar-Meskéné and Tell Fakhariyah where the Middle Assyrian glyptic covers the entire 13th century BC. There are no comparisons from Tell Billa as the sealings there, dated by associated texts, belong mainly in the early and middle part of the 13th century BC (Matthews 1991: 18f). The Middle Assyrian glyptic from Tell Sabi Abyad (Akkermans 1998), which spans the end of the reign of Shalmanesar I and the entire reign Tukulti-Ninurta I, (1234-1197 BC), includes no parallels to the Ziyaret seal but that may be due to the small size of the corpus.

The key to dating the Ziyaret seal lies in the posture of the horned animal, which is typical of the late 13th century BC (Tukulti-Ninurta I, 1234-1197 BC) but is also encountered during the 12th century BC (Moortgat 1942: 16; Mayer-Opificius 1986: 163). Described variously as leaping, prancing, rearing, and collapsing, the animal is shown resting on one bent foreleg, its back arched and one or both hindlegs kicking up in the air. The variety of terms derive from more explicit scenes in which the animal appears to be leaping down from a mountain (Porada 1948: no. 610E), prancing before a tree or an ostrich (Kantor 1958: XXI-XXIII; Beyer 2001: G5), rearing before a human or demonic aggressor (Moortgat 1944: 11, 12, Parker 1977: no. 29) or collapsing under its attack

(Moortgat 1942: Abb. 37; idem. 1944: Abb. 19). Given these varied contexts, bucking (Moortgat 1944: Abb.12) or buckling under also describes this posture.

The animals depicted in this manner are mostly horned and include bulls (Kantor 1958: XXIV, Muscarella 1981: no. 79), mountain goats (Moortgat 1942: Abb. 7, 27, 54; idem 1944: Abb. 19), stags (Porada 1948: no. 601E) and ibexes (Parker 1977: no. 37), as well as horses (Moortgat 1942: Abb. 22a; idem. 1944: Abb. 11). Some 13th century examples (Kühne 1980: no. 51 = idem. 1984: Fig. 17) and, especially, 12th century examples (Moortgat 1944: Abb. 22, 23; Buchanan 1966: no. 570; Lambert 1979: no. 65) include monsters that are sometimes winged.

Trees associated with the bucking and rearing animal either have branches that radiate out from the top of the trunk to form a round contour (Moortgat 1942: Abb. 54; Porada 1948: no. 601E) or branches that extend laterally from the sides of the trunk (Moortgat 1942: Abb. 7; Buchanan 1966: no. 570; Parker 1977: XXII, XXIII). The tree is sometimes shown rising from a hill or mountain (Porada 1948: no. 601E) and often has a thin, twisted or crooked trunk (Porada 1948: no. 601E; Buchanan 1966: no. 570; Parker 1977: XXI-XXIII). A similar tree trunk may have been obscured by the weathering of ZT6545 as the outline of the trunk appears unusually thick and straight.

Various symbols accompany these scenes, often placed in the field above the animal's arched back. Some such as the rosette (Matthew 1991: 17), have a limited time range, but the crescent and star (Parker 1977: XXI-XXIV), which may be depicted on ZT6545, is common throughout the Middle Assyrian period (Matthew 1991: 17).

Locus E-323, ZT 3635

"Burnt Steatite" Cylinder Seal

Description: Cylinder seal with perforation drilled from both ends. An eleven-petalled rosette design with triangular filler motifs. The center of the rosette is formed by a dot and circle and the crescent-shaped petals curve away from the horizontal axis of the design. The rosette is surrounded by two unconnected curved lines that produce a single-stranded guilloche pattern when the seal is rotated more than once. Two triangular filler motifs are outlined by three (cuneiform-shaped) wedges that leave a hollow central space. Above and below, the design is framed by a single incised line.

Material: "Burnt steatite"

Dimensions: 24 x 31 mm (length of impression x height of impression/seal), d. 7.6 mm, perforation: 3.4 mm.

Condition: Chipped in places revealing grey stone behind white surface. Mechanically cleaned to remove salt encrustation.

Findspot: Locus E-323 in square N1080 E1210. Found loose in surface layers of the step trench. Approximate location N1086 E1216, elevation c. 552.0 - 552.6.

Date: Early third millennium BC on the grounds of stratigraphic context and style.

Provenanced Comparanda: There are no close comparisons for the overall design and style of the Op. E seal. Although individual elements of design do have parallels, their combination here is unique. Rosettes are common but the unconnected, single curved lines which surround this rosette are rare, as are the number of petals and their crescentic shape. Triangular filler motifs also occur in related designs but they are not usually formed by multiple wedges. These normally occur individually and are scattered in the field.

Iran

Susa (unstratified): Amiet 1972: nos. 1142, 1143

Eastern Mesopotamia

Khafaje (Sin IV): Frankfort 1955: nos. 87, 88, 89, 93 (acc. to Frankfort Protoliterate d, now dated to ED I)

Khafaje (Sin VIII): Frankfort 1955: no. 241 (acc. to Frankfort ED II, now dated EDII-IIIA)

Tell Agrab (Shara Temple): Frankfort 1955: no. 815 (acc. to Frankfort ED II, now dated ED IIIA. Note that more than 60% of the seals found in this location were heirlooms)

Tell Madhhur (ED I): Watson in Roaf 1984: 163, Fig. 24, 10-11

Tell Gubba (Levels VII-III): Ii 1988: Fig. 23, Type 3c (dating JN to late ED I. The single example from ED IIIb is on a coarse ware rim sherd and is probably residual)

Assyria

Nineveh (Level 4/5): Collon in press: nos. 18-30

[The revision of the Diyala sequence is based on Porada et al. 1992 in which the existence of a separate ED II phase is found not to be useful.]

This seal found in the lower part of Operation E belongs to a homogeneous group of cylinder seals that is now commonly known as "Burnt Steatite Style" after its dominant material, or "Piedmont Style" after its main distribution (Buchanan 1966: 16; Collon 1987: 20-23; Pittman 1994; Marchetti 1996).

Le Breton (1957: 108) was the first to draw attention to the distribution of this group that follows the main highland routes from Shahr-i-Shokhta in Iranian Sistan to Alishar Hüyük in central Anatolia (Pittman 1994: 230-242, Marchetti 1996) with particular concentration in the foothills of the Zagros (Fars, Khuzistan, Diyala, Hamrin) and northern Iraq. The characteristic material is a soft stone that was heated after cutting to produce a much harder surface layer. This material is variously described as burnt steatite (chlorite), glazed steatite (chlorite), calcined stone or enstatite (Amiet 1972: 143; Roaf 1984b; Pittman 1994: 133-35, 222-3). Seals bearing designs in similar style are also made of other stones (e.g. white calcite, limestone, marble, heulandite, gray schist) as well as shell and, occasionally, bitumen and faience. Usually tall and narrow, these seals are often decorated with overall patterns in which floral and geometric motifs predominate. While some scholars emphasize this aspect of the design (Buchanan 1996; Collon 1987; Pittman 1994) others emphasize an expanded repertoire that includes figural motifs (Frankfort 1955; Marchetti 1996). Pittman, in her study of the "Glazed Steatite

Style" in Mesopotamia and Iran, divides the designs into two main groups: the multiple element and the hatched group (1994: 141-206). Based on the entire distribution of the style, Marchetti (1996: 81-2, n. 2) following Frankfort (1955: 17-19) proposes two alternative groupings: a "Piedmont style" consisting of geometric designs and a "naturalistic Piedmont style" characterized by schematic figurative motifs. Typical geometric designs include hatched bands and meanders, rosettes, crosses and lozenges, with fillers and drill holes. Figurative motifs consist of animals, mountains and trees. Both groups of Piedmont style designs appear to have been used mainly for door locks and jar sealings (Carter and Stolper 1984: 119; Dittmann 1986: 347). Regional variations in iconography may reflect different centers of production. The source of steatite, however, is likely to be southern Iran, which is also identified as one of several production centers of contemporary chlorite bowls (Kohl 1974: 101; 1978). The chronological range of Marchetti's all-inclusive Piedmont Style, based on the Diyala sequence in eastern Mesopotamia, extends from Jemdet Nasr to late ED II (c. 3000 - 2600 BC). Within this range, there appear to be regional differences with examples from Iran and eastern Mesopotamia beginning earlier (JN-EDIIIa though the later examples were probably heirlooms) than those from northern Iraq and the Khabur (ED I - late ED II, Marchetti 1996: 96-101, see idem. 1998: 117, n. 13 for revised end date).

Pending a thorough analysis of its associated pottery, ZT3635 is attributed to the first half of the third millennium BC, following the date of related material found in the Khabur basin, due south of the Ziyaret Tepe.

Ceramics from the Brightly Burned Building

A preliminary assessment of the well-stratified pottery from the Brightly Burned Building in Operation E has been prepared by the project ceramicist, Ms. Helen McDonald of the University of Cambridge. This group of pottery was found in the collapse and on the floors of a violently destroyed burned building we refer to as the Brightly Burned Building (hereafter, "BBB") dated above to the first half of the second millennium BC. This pottery is illustrated on Figs. 5-8 and reference numbers in the text refer to pot drawing numbers on these plate. A complete catalogue of the ceramics follows in Appendix A.

Small areas of two rooms of the BBB were excavated (Matney et al. 2002: Fig. 20) and produced a large quantity of pottery for so small an area. Several of the pots had over half of their sherds present and may have been complete at the time of the destruction, however there are a variety of reasons why every sherd was not recovered. Firstly, fragments of some parts of the pots may still lie in the unexcavated portions of the rooms. Secondly, these rooms are positioned right along the edge of the mound, where they are prone to erosion downslope. Thirdly, the effect of the burning has made the fabric of many of the pots very friable, and joins between pieces of the same pot are not always possible; in some cases, the friability has even caused parts of some vessels to

disintegrate entirely. It is likely that several of the larger bowls were complete but have lost their bases due to this extreme friability (e.g., pots 2, 3 & 5). Some of the vessels that are now fifty per cent extant were probably complete at the time of the destruction.

Another effect of the burning has been to alter the color of most of the pots; many are very yellow, bright pink/red, or a warm reddish brown, similar colors to the baked plaster of the floor and collapsed roof. In other cases different parts of the same pots are now very different colors (see esp. pot 2). Hence, the Munsell colors in the descriptions probably do not reflect the original color of the pots. One of the most common color changes is that of a very bright pink interior surface, which may indicate that the pot had flammable contents (e.g., pots 5, 6, 8 & 9).

Several of the vessels, and particularly some of the sherds, are covered with baked plaster. In cases where the baked plaster also covers the broken edges of the sherds, it appears that these were incorporated into the plaster of the roof, which had then collapsed in the conflagration (pots 4, 8, 17, 20). Two of the more complete vessels have acquired lumps of baked plaster on their exteriors, but this probably happened as the roof collapsed on them (pots 10 & 13). As a result, the BBB pottery assemblage seems to be a mix of pots on the floors of the rooms and sherds from the construction material of the collapsed roof. It is conceivable that one or two of the more complete items might have been on top of the roof when it collapsed.

The paucity of excavated and published pottery material of this date makes comparisons with nearby sites difficult. However, there are broad similarities with some of the material from nearby Üçtepe (Sevin 1992; Köroğlu 1998). The most common bowl form in the BBB rooms is the deep carinated bowl, which occurs in both a small version (pot 1) and a variety of larger versions. The larger carinated bowls can be divided into groups of those with a concave line above the carination (pot 5) and those that are less so (pots 2 and 3) with pots 1 and 6 as an intermediate examples. Base 8 may come from one of these bowls, or one like it. The more complete examples of this type are all plain but body sherds 4 and 17 indicate that this bowl shape could also be painted. There is a very general similarity with deep carinated bowls from Üçtepe (Sevin 1992: fig 4 nos. 1-4), and the Üçtepe bowls also seem to come in a larger (Sevin 1992: fig 4.1) and a smaller size (Sevin 1992: fig. 4.2-4). The latter are reasonably close to the shape of pot 1, although the Ziyaret example has a smaller base and a ridge on the shoulder rather than a series of grooves. The larger Üçtepe bowl (Sevin 1992, fig 4.1) is more similar to pot 5 than it is to the straighter examples like pot 3, but again where the Ziyaret bowls have a single ridge the Üçtepe example has two ridges, a wavy line and grooves. The other BBB bowl forms are more open, shallow types with out-turned or triangular rims and flat or ring bases (pots 9 - 10). Again, both of the latter have broad similarities with some of the Üçtepe bowls (Sevin 1992: fig. 5 nos. 1-4). The spouted bowl 11 has two lugs, enabling someone to hold it while its contents were poured out.

The rim shape from the BBB jars is rolled with a neck that slopes into the shoulder with no carination separating them (pots 12-14). With one more bottle-like exception, all other jar rims from the BBB were variations on those illustrated. The single ridge on the shoulder is common on both jars and deep bowls.

There are sherds in the BBB that seem to correspond to the so-called 'Red Brown Wash Ware' (RBWW) of the first half of the second millennium. Eleven body sherds (3.16% of all sherds) have some kind of wash on the surface, as do four bowl rims (including 15). Two of the RBWW body sherds have a single or multiple grooves and may be from carinated bowls. The wash varies from very thick and red-brown color to a much thinner wash with visible brush strokes of dark brown or black. The other three RBWW bowl rims have folded, triangular rims; two are from medium vessels, and the third is a thicker walled vessel with a rim diameter of 40cm and heavy ridges below the rim. The latter is also heavily worn and may be somewhat earlier than the BBB level. It is always possible that sherds in a deposit may be residual, so the presence of sherds alone in a level cannot be taken as definite evidence of contemporaneity. While it is possible that RBWW belongs in the BBB level, and there may be complete vessels of RBWW elsewhere in the building, we have no conclusive proof of this in the small area so far excavated.

The deposit at Ziyaret Tepe in which RBWW sherds were most plentiful is in Operation C on the opposite side of the high mound from Operation E. Although a large quantity of sherds was found in Locus C-014, they were not complete pots broken *in situ* like some of the BBB vessels. However at least one of the large RBWW rims from Locus C-014 had baked plaster on its surface like some of the BBB sherds (cf. Matney et al. 2002: fig 13, ZT 1910/8 for shape). In general, however, the vessel types in the two areas are not closely related.

Painted decoration is relatively rare in the BBB; only four sherds (1.14%) out of a total of 348 were painted (sherds 4, 16-18), whereas 29 body sherds had ridges or grooves (8.33%). The frequency of ridged/grooved decoration is higher if rim sherds are also included bringing the total up to 39 (11.2% of all sherds).

The most common fabric was one with fine mineral inclusions varying in frequency from occasional to common, and with fine-to-medium vegetal inclusions varying from sparse to occasional (65.8% of all sherds). Less common was a similar fabric that lacked the vegetal inclusions (15.8%) and another fabric where the vegetal inclusions were more prominent being larger and of greater frequency (6.3%). The 'cooking ware' fabric had abundant medium-sized mineral inclusions or mica and all of the sherds of cooking ware were burnished (4.6% of all sherds). The one complete cooking vessel (pot 19) is the only complete vessel from the smaller of the two rooms (Locus E-061). Burnishing on other fabrics was not otherwise common, the only fine ware sherd was burnished and one sherd had a burnished interior and may have been a base. There were a small number of thick-walled sherds, probably from storage vessels, with

coarse and abundant vegetal inclusions (1.5%) or a mixture of coarse vegetal and coarse mineral inclusions (0.5%). Interestingly, the sherds with abundant medium-to-coarse mineral inclusions were not huge storage vessels, but more medium sized (5.4%; bowl 11 and three medium jar rims). This is in contrast to later second millennium BC levels at Ziyaret Tepe, where such a fabric is more commonly be used for very large vessels. This coarse mineral fabric is distinguished from the regular cooking ware fabric by being paler (yellow rather than brown) and not burnished.

Although the more complete vessels in the BBB are in primary contexts, they probably represent only a very small proportion of the forms in use at this time, due to the small size of the exposure that has been excavated. A larger exposure will enable us to recover more of the ceramic repertoire of this date and to assess the nature of the building and its destruction, whether this was an isolated fire affecting a single building or a more extensive destruction of the site.

Operation A

Operation A is located on the eastern edge of the high mound between grid squares N990 E1150 and N1010 E1190. To date, we have excavated 500m^2 of architecture [Fig. 9], almost all of which dates to the Late Assyrian period based on ceramics and other small finds from stratified contexts within the structures. Work in Operation A during the 2002 season was under the field direction of Mr. Duncan Schlee (Welsh Archaeological Unit) and Mr. Andrew Bauer (University of Chicago). The goals of the 2002 excavation in Operation A were: (1) to cut a sounding at the edge of the high mound in order to determine the nature and date of the strata beneath a large mud-brick platform of Late Assyrian date discovered in the 2001 season; (2) to complete the excavation of a third metal-working installation at the southern edge of Trench N990 E1180 discovered in 2001 and not excavated for lack of time and (3) to clarify a detailed architectural sequence of remains from the principal monumental building. This latter goal was meant to clarify the original building plan and subsequent modifications to the architecture. All three goals were achieved. In this report, however, brief preliminary comments will be limited to the first of these goals, namely a description of the sub-platform sounding. Reconstruction of a detailed architectural sequence of the main Late Assyrian building is still on-going and the publication of the remains of the metalworking installation awaits the completion of specialist studies scheduled for the summer of 2002.

Sounding beneath Late Assyrian Platform

As noted in earlier reports, the principal remains from this area are a large mud-brick building, possibly a palace. The walls of this structure are large (1.5m wide) and very well constructed, clearly representing an important public building. Soundings through the building, as well as at the edge of high mound, have shown that prior to the

construction of the building, the entire area of Operation A was leveled and a huge mud-brick platform was built, presumably in order to make a stable foundation for the monumental structure that was built on top. During the 2002 season, we cut a section at the edge of the tell revealing the mud-brick platform to be at least 1.5m thick, perhaps even greater in places. This platform sealed a number of earlier deposits of Late Iron Age and possibly Middle Assyrian date.

Directly beneath the mud-brick platform was a layer of gray levelling mud (A-834) which was laid down over the existing structures, which were themselves cut down and filled with poor quality mud-brick prior to building. The area was slightly disturbed by later animal burrows coming in from the side of the mound. Stratified below the platform were two pits (A-836 and A-832) and the foundations of a mud-brick wall, approximately two courses wide (A-840). Unfortunately the surface or floor associated with this wall was at a higher elevation and did not survive the building of the platform. The wall foundations had been partially trenched into a filled pit (A-839), into which the mud-bricks have slumped. Likewise, the wall A-840 was itself cut and then filled irregularly with mud-bricks that were levelled with the grey mud noted above. The architecture in the north of the sounding (wall E-844) is modest in size and probably dates to either the local Early Iron Age or a pre-platform phase of the Late Assyrian occupation of Ziyaret Tepe. In the southern section of the sounding, a large, regular mud-brick wall (A-851) at least 1.5m wide was discovered at the end of the season. Its alignment is similar to that of the later platform and associated monumental structures. Given its size, quality and alignment, it is possible that this wall is part of an earlier monumental structure that was replaced in the Late Assyrian period.

Operation G

In 2002, work resumed in Operation G, the area where excavations last year revealed part of an impressive Late Assyrian structure with a striking black and white pebble pavement and walls up to 2m thick. Operation G is located in the southern part of the lower town between grid coordinates N860 E850 and N880 E880. Excavation in Operation G was directed by Dr. John MacGinnis of the University of Cambridge, this season assisted by Mr. Tom Burns as site supervisor. In 2002 we opened up a further 350m^2 of the building, revealing more of the courtyard and five more rooms on its western side. Fig. 10 shows the architecture from Operation G excavated in the 2001 and 2002 seasons.

The principal remains in this area are parts of two large, very well preserved mud-brick buildings. The first of these is represented by Rooms 1, 2, 3, 4, 7 and 8. The second is represented Rooms 9, 10, 11 and 12. The most important architectural features of these buildings are two pebbled mosaic floors (Rooms 2 and 11) constructed of small flat river stones carefully laid diagonally into alternating black and white squares. These squares form a checkerboard mosaic with individual squares decorated with crosses, central

bosses and rosette patterns. A large portion of one mosaic (Room 2) was uncovered in the eastern section of Operation G in 2002, where the extent of the floor is 12m from east-to-west and at least 15m from north-to-south, although the southern wall of the room has not been recovered. A small corner of a second mosaic floor was found in the westernmost portion of Operation G (Room 11), but was only exposed over a small area.

Starting with the courtyard (Room 2), excavations this year revealed more of the cobbled pavement, with evidence of two phases of construction. An initial phase made out of smaller pebbles was somewhat untidily laid out, incorporating rosettes, St. Andrew's crosses and crosses with a central boss. Tentatively we believe this was partly replaced by a later pavement of larger stones, more neatly laid, but consisting only of black and white squares in a classic chequerboard manner. Parts of two rooms were excavated on the west side of the courtyard (Rooms 7 and 8). The first of these was a long but comparatively narrow room, 4.5 m across and at least 13m in length (Room 7). Very little was found in this room, but it did have two supports for small pillars in the shape of baked bricks, with holes 17cm in diameter in the middle placed exactly on the center line of the room. At the northern end of this room was a smaller chamber (Room 8), approximately 5m wide and 2.5m deep. There was an entrance from Room 7 into Room 8, the latter having no additional exits. As yet there is very little evidence to suggest what the function of either of these rooms might have been. In 2002, a series of thin sections taken through the floors of Room 8 by Mr. Brian Pittman (University of Cambridge) are aimed at elucidating the constructional details and function of the architecture.

The remaining rooms uncovered in the 2002 season lay further to the west side and proved to be of great interest. The presence of what seemed to be two adjacent parallel walls separating Room 7 from Rooms 9 and 10 [Fig. 10] might suggest that there were two abutting buildings here in the Late Assyrian period. An equally compelling case could be made, however, for the double wall to represent an interior wall of a very large complex. The solution to this question will only come about through continued excavation in future seasons. The first of these western rooms [Fig. 11], Room 10, was another long room containing three complete pithoi, the largest of which was 1.90m tall. To the north of Room 10 a smaller room (Room 9) had another large jar let into the floor as well as a pit approximately 1.5m in diameter. The pit may have been dug for the installation of one of the pithoi. It is clear that this part of the building was part of a magazine complex as discussed in more detail below. A second point of interest in these rooms was the recovery of a number of clay tokens in a variety of shapes – square, star-shaped or stellar, spherical, cylindrical among others – that may have served as accountancy aids [Fig. 12]. The interpretation of the tokens as accounting markers is supported by the discovery of a number of cuneiform texts in the detritus at the edges of the Rooms 9 and 10, all of which are of an administrative nature. Finally, we excavated the remaining area west of Rooms 9 and 10, revealing another cobbled surface in Room 11, well laid though not with the same geometric patterns as the main cobbled courtyard,

with the base of a stone wall resting on it. In many areas in the building the floor was covered with a thin layer of ash, and in several places the white plaster of the walls was burnt. It would therefore seem that there was a fire, at least in some rooms of the building at the end of its period of use.

As in 2001, we carried out a sounding through the floors in one part of the area excavated (Room 8). The investigated area revealed what appears to be a mud-brick platform that begins directly under the floor and continues down to the natural, some 1.5m below. The presence of a platform here will need additional investigation in the 2003 season, but it is important to note that this finding is in contrast to those of last year's soundings, which revealed stratified architecture below the main building (Matney et al. 2002: 69)

The only indication of any occupational history in the area of Operation G subsequent to the main Assyrian building is a grave (G-622), cut into the mud-brick collapse in Room 7. The associated bones were in a very poor state, and the cut itself was not initially recognized, but a coherent assemblage of grave goods were preserved, consisting of two whole ceramic vessels (ZT 11727 and ZT 11609) and a complete bronze omphalos bowl (ZT 11636). This bowl was conserved by Ms. Evelyn Alvarez-Dossman and is currently being studied by Dr. John Curtis of the British Museum. A close parallel for the bowl is said to come from Deve Hüyük and is now in the Ashmolean Museum Oxford (Ash. 1913.673, Moorey 1980: 32, Fig. 6, No. 85): it has been dated to the sixth or early fifth centuries BC.

Cuneiform tablets from Operation G

For the first time at Ziyaret, the 2002 season saw the discovery of many cuneiform tablets [Fig. 13]. They were found in detritus piled up against the walls of the magazines in Rooms 9 and 10. With permission from the General Directorate for Monuments and Museums in Ankara, the tablets were baked in Diyarbakır under the supervision of Ms. Ann Donkin following procedures used by Michael Roaf for the baking of the Middle Assyrian tablets from Giricano in 2000 (Roaf in press). The tablets were slowly heated to 630°C over a period of three days and then baked for 24 hours at this temperature before being allowed to cool slowly. Prof. Simo Parpola arrived from the University of Helsinki to read the tablets and to join fragments that were broken in antiquity or during the process of excavation. The baking procedure was successful and Prof. Parpola succeeded in joining many pieces and reading the tablets. The texts will be published in full in the *State of Archives of Assyria Bulletin*. The following is a brief summary of their contents based on Dr. Parpola's initial readings in the field. The tablets have been numbered with a series prefix of ZTT (Ziyaret Tepe tablets). A number of tiny fragments are not treated here.

A total of twenty-one cuneiform tablets, fragments and pieces of envelope were found at Ziyaret Tepe. All are small -- the largest measures about 5cm by 3cm -- but the

variety and detail of the information they preserve more than make up for this. Three of the tablets bore sealings -- ZTT 3, ZTT 6 and ZTT 10. The texts fall into the following categories:

Loans and allocations of grain

ZTT 2 with its envelope ZTT 3, a loan for 280 homers of barley.

ZTT 4 with its envelope ZTT 5, a loan of 6 homers of grain according to the 9 *seah* standard of Nineveh.

ZTT 10 through ZTT18, grain loans (ZTT 14-18 triangular format).

Slave sale

ZTT 7 and its envelope ZTT 6.

Lists

ZTT 1 a list of equids including 200 horses, 180 mules and 40 donkeys.

ZTT 8 a witnessed list of textiles.

ZTT 9 a list of people.

Letters

There are three pieces of letters ZTT 19-21, all fragmentary though one (ZTT 19) appears to deal with deportation and resettlement.

A number of professions are mentioned in these texts, including governor (ZTT 14), cupbearer (ZTT 8), mayor (ZTT 8), charioteer (ZTT 13), scholar (*ummānu*, ZTT 13), a scribe of Ishtar of Nineveh (ZTT 6) and other scribes (ZTT 4 and ZTT 8), fuller (ZTT 6), tanner (ZTT 6), oil-presser (ZTT 10), groom (ZTT 13) and bakers (ZTT 14). A Babylonian is mentioned in ZTT 13 and a man called Kaldāyu ("Chaldean") in ZTT 9. Among the witnesses in ZTT 4 is a "Shubrian augur" (^{lú}*da-gíl*-MUŠEN) with the Akkadian name Šumu-līšir.

In most cases the texts are either undated or the date formula is not preserved, but there are three exceptions. ZTT 4 is dated to Nabû-tappūtī-alik, a late post-canonical eponym from shortly before the fall of Nineveh in 612 BC, while ZTT 6/7 is dated to Aššur-šarrāni and ^{m}A-[...], both of whom Prof. Parpola tentatively suggests may be post-612 BC eponyms. The governor mentioned in ZTT 14 is almost certainly the governor of the province of Tushhan. This allows us to reflect further on the nature of the complex in which the texts were found. By the end of excavations in 2001 we had formed the belief that the Operation G building was a high status residence, belonging to either a senior official or a wealthy merchant; there is of course considerable overlap between these two categories. This remains a possibility, but equally the presence of magazines and records of barley debts, one of which mentions the governor, led Prof. Parpola to the interesting suggestion that the complex could be a tax collecting center for the provincial Assyrian government.

The mention of the governor in ZTT 14 noted above adds weight to the growing body of circumstantial evidence that Ziyaret Tepe can be identified as the Late Assyrian

city of Tushhan (for a summary of the evidence see Roaf in Matney et al 2002: 49-51 and for further discussion and a list of the governors of Tushhan see Radner and Schachner 2001). This is also supported by the reference to a harem in ZTT 13, as other textual records suggest that Tushhan was the location of such an institution while it served as a regional center (Parpola, pers. comm.). Further elaboration of these arguments, however, must await Prof. Parpola's final publication of this small Late Assyrian archive.

Operation J

Operation J was started in the 2002 field season at the western edge of the lower town between grid points N890 E740 and N910 E760. Work in Operation J was directed by Dr. Monica L. Smith of the University of California–Los Angeles. The area excavated reached a maximum size of 15m north-south and 16m east-west. The most significant finds of the season consisted of three phases of architecture interspersed with two episodes of abandonment. The decision to excavate in this general area was based primarily on surface finds made in the 1997 field season that included a high distribution of roof tile fragments on the low rise that comprises the western lobe of the lower town. This area appeared to have some of the latest material at the site, preliminarily identified as Roman in date, so it was determined to investigate this area to evaluate the nature of the latest deposits, and to see whether these later deposits preserved intact earlier material underneath.

The choice of exact area for excavation was based on both a gradiometry study (see below for details) and a surface survey and mapping of the artifactual remains in the plowzone. The gradiometry study was undertaken on four 20m by 20m meter grid squares on the low rise, while the surface map was made over nine whole or partial 20m by 20m grid squares. The gradiometry and surface surveys were conducted concurrently, that latter involving a detailed collection of data with all tiles, all stones over 10cm in size, and all sherds mapped on graph paper. The distribution of surface materials indicated a high concentration of tiles near the center point of the four gradiometry trenches (datum N900 E760). We therefore placed our initial trench (N900 E750) in the area of the densest proportion of tiles (2.5+ per square meter) as the initial area for excavation. The gradiometry maps showed several large anomalies (one corresponding to the metal peg at the N900 E760 datum) with scattered strongly bipolar data. It was not possible to detect clear wall lines or other features within the data, rather the anomalies were spreads about 20m in diameter. During excavation, it became clear that these anomalies were concentrated collections of roof tiles that had been reused, as described below.

The uppermost phase architecture excavated in Operation J was encountered immediately below the plowzone (c. 10-15cm below modern ground surface) and consisted of at least three contemporary structures consisting of a series of walls and post

supports made of reused materials, mostly stones and roof tiles [Fig. 14]. A total of eleven walls and wall fragments were recovered, and the styles of the walls varied from well-organized stone-border constructions to wall stubs made completely of tiles that were laid on edge. Broadly speaking, these walls outlined one discernable room, one independent structure, and one unknown structure.

The room, located at the southern end of the trench measured 2.6m by 3.0m in size and had all four walls well-preserved, as well as a passageway to a much larger architectural unit, probably a courtyard, in which there were walls made at what appeared to be different stages of construction (but with construction events that were probably spaced very close together). This space was bounded on its north and west side by walls, wall fragments and post supports made of small cobbles as well as at least one larger stone that may also have served as a post support. It measured 7m meters north-south, while the east-west dimension could not be discerned because it was beyond the limits of the trench size. Within the "courtyard" was an independent structure consisting of three interconnected walls (J-003, J-004 and J-030) and three post-supports of varying sizes made of tiles fragments. The total size of this structure was 2m by 6m and it was probably had a porch-like construction. An unclear structure not shown in Fig.17, is located in the SE corner of Operation J and consisted of one large (60cm by 70cm) stone that was at the center of a very fragmentary tile alignment running E-W for 3m and into the eastern baulk.

Architectural features in the latest phase of occupation suggests a very expedient method of construction. The walls were preserved to a maximum of two courses, and were made of reused tile and stone fragments, including grinding stone fragments as well as fragments of a shaped column and a fragment of a socketed stone in which the socket was placed upside down – therefore not the original location of the door for which the stone socket served. However, the architecture was well outlined (i.e., the work was reasonably good but the materials used were very fragmentary and uneven). In its very last episode of use, this upper phase architecture appears to have been the location of a brief encampment or squatter settlement, as there was a thin layer of ash and at least one likely complete vessel (lying in the plowzone and fractured by subsequent plowing activity) that seems to have been deposited prior to the collapse of the tile superstructure. As we found some tiles that had broken as they fell, it appears that the builders of the uppermost phase architecture did have access to some larger-size and intact building materials. We removed over 2000kg of tiles from the excavations, an amount that indicates a substantial labor investment was involved to transport these used materials to this portion of the site.

Removal of the upper phase architecture revealed an exceedingly empty matrix. Having exposed the upper phase architecture throughout the 9m by 16m trench, we then continued the excavation only in the northern portion of the operation, first completely removing the upper phase architecture in those trenches. After c. 30cm of grayish-brown

matrix that was remarkable for its relative lack of stones, we encountered a substantial stone wall (J-054) and adjacent stone "pad" (J-055) in the southwestern corner of the trench. Wall J-054, measuring 1.7m in width, was well-made and consisted almost entirely of stones in the 20-centimeter size range, although there was one substantial (50+cm in diameter) ceramic rim, upside down, which formed a component of the wall corner as the wall turned to the west. The western section of the wall appears to have been robbed out prior to our excavation. As in the case of the walls that comprised the upper phase of architecture, Wall J-054 may have been the footing for a mud or pisé wall, although we could not distinguish the traces of an upper wall in the section; nor could we distinguish any foundation trenches. There were no good associated finds to date this architecture.

After removing Wall J-054, we again encountered relatively stone-free matrix for a depth of 30-50cm, although the quantity of ceramics increased with depth. In the northwest corner of the trench we encountered an area of cobbles (J-058), which was eventually exposed throughout the northern part of the trench for a total area of 7m by 4m. This cobble surface extends into the baulk on the north and east sides, so it is considerably larger than what has been excavated. The cobble surface has a significant slope from northwest (high) to southeast (low), losing about 30cm in elevation over 6m across the trench. The cobble area J-058 was cut by a large (2.3m by 2.1m) pit filled with a very powdery gray matrix and large-sized sherds, as well as one *tannur* or earthen oven measuring 30cm in size and recovered upside-down near the bottom of the pit. This pit provided us with a substantial window into underlying deposits, the most distinctive of which was a bright red-orange matrix with white inclusion typical elsewhere on the site as natural (or redeposited natural) soil. Since no tiles were found in the pit, it dates to the period prior to the construction of the uppermost architecture; given the apparent abandonment between architectural phases, it is most likely therefore that the pit is contemporaneous with the middle phase of architecture represented by wall J-054.

In summary, then, the Operation J architectural sequences suggest three periods of construction, interspersed with two major periods of abandonment that were of sufficient duration to allow the exposed architectural remains to be covered by 20cm to 30cm of matrix through windborne action and other soil formation processes. The last occupation of the site was represented by the construction of walls made of used tiles, and this phase ended with a brief re-occupation that can be characterized as a casual or squatter settlement. Although sequences of construction, habitation and use can be readily identified in Operation J, no dates can easily be discerned at this point. Artifacts that are likely to be chronologically sensitive include tiles, ceramic vessels, glass vessel fragments, a bronze projectile point, a clay pipe, and metal items. The initial proposal was that the area might be linked to the Roman period due to the presence of roof tiles on the surface of the site. However, the use of broken tiles in the upper phase architecture indicates that these tiles were originally brought from elsewhere, as we did not encounter

any tile-using architecture after the removal of the upper phase. We had initially supposed that the uppermost architecture could date to the latter half of the first millennium A.D., but now suspect that it could be much later. One would have to look at the historical record to see if there are records of isolated farmsteads or households in this area during the early modern period.

The middle phase of architecture is most likely to be dated by the materials found in pit J-057, which includes a large number of handled jars of a type also found consistently throughout the upper levels of all of the trenches. The large jar incorporated into locus J-054 also serves as a *terminus post quem* for the wall, though of course the date of initial use and subsequent reuse could have been relatively rapid.

The lowest phase of architecture, represented by the cobble pavement J-058, may be of the Assyrian period, though no definite indicators of such a date can be confirmed at present. The ceramics from Operation J include wares that go back to at least the mid-second millennium B.C. (i.e. a fragment of "Nuzi" ware from locus J-047). There are also several fragments of very fine ware in the loci immediately above the cobble surface J-058; comparative dating of these fragments will be of value. Evaluation of the date of the structure J-058 may also be bolstered by comparison to securely-dated similar architecture elsewhere in the site.

Specialist Reports from the 2002 Season

A wide range of specialist studies are actively being conducted at Ziyaret Tepe: paleobotanical, faunal analysis, ceramic, metallurgical and lithic analyses, micro-debris and microstratigraphy studies. This section provides preliminary results from two of these studies, namely those dealing with micro-debris analysis and a short description of the chipped stone assemblage at Ziyaret Tepe.

Micro-debris Analysis

During the 2002 season, 155 micro-debris samples were processed. Thirty of these micro-debris samples were collected in 2002 and 125 samples were previously collected during the 2000 and 2001 seasons. This work was directed by Dr. Lynn Rainville of Sweetbriar College, and was funded by the American Research Institute in Turkey. These samples were taken from a variety of areas and loci to provide a wide comparison of domestic and non-domestic contexts (Operation A – 12 samples, Operation E – 25 samples, Operation G – 115 samples, Operation F – 2 samples). This wide distribution of samples enabled us to compare and contrast different socio-economic areas of the site from the monumental building excavated in Operation A to a series of 3rd millennium occupations and a series of Middle Assyrian domestic structures in Operation E to a large, Late Assyrian building in Operation G.

The majority of the samples in Operation G (n=89) came from floor deposits that were gridded into 50cm collection units, and sampled explicitly for micro-debris analysis. This is an ideal way to collect micro-debris samples in which the horizontal dimension is well understood and each of the samples comes from a well-documented primary context. The soil samples were floated using the flotation machine used at Titriş Höyük, based on the design used at Shiraf in Iran. The heavy fractions was sorted and micro-artifacts were identified and picked out of the fraction.

An unexpected result of this past season's work was the recovery of enough beads in the heavy fractions to start a Mesopotamian bead typology. Fourteen of the 155 samples contained a total of 28 individual beads from all sampled areas, except Operation F. One of the advantages of micro-archaeology is the opportunity to collect artifacts that would often be missed by traditional excavation techniques. Most of the beads are no more than 4mm in diameter, making it difficult, if not impossible to locate them with either troweling or screening techniques. Micro-archaeological techniques also recovered several clay tokens, an assortment of copper flecks, and fragments of several iron and bronze/copper nails and/or pins. In most cases these objects were not visible until after the floatation process. Remarkably, the flotation removes clays and other large sediments, and if done correctly, it does not harm small and fragile artifacts, which can be picked out from the heavy fraction.

Another aspect of the 2002 micro-debris study was the start of an experimental archaeological effort to understand breakage patterns in micro-artifacts. Ever since Schiffer's seminal work on post-depositional forces (1996 [1987]), archaeologists have been aware of the importance of understanding how artifacts entered the archaeological record. This past season, modern shells from the Tigris River that correspond to species found in archaeological contexts were collected. An informal experiment was done to determine what type of force would have to be exerted on the shells to produce the breakage patterns in micro-debris samples. In short, results suggest that it is quite difficult to break the shells unless they fall on a very hard surface (such as concrete) from a distance of over a meter. Moreover, one has to exert an additional downward force to break the shells. This suggests the shells in the ancient samples were not broken simply by treading over surfaces (especially without shoes) nor were they likely to break from being dropped (especially onto a mud-brick surface). Rather, it would seem that the shells were intentionally ground up to provide a temper for the construction of pottery or other technological processes. Otherwise, there is no readily apparent explanation for how riverine fauna reached the top of the tell in such degraded condition. In future seasons, continued experimentation with ceramic breakage (from the discard pile of sherds) and animal bone breakage will help us understand artifact breakage, for both large and small pieces, and will enable better interpretation of patterning in archaeological samples. Ideally, this will lead us to an ability to distinguish between natural and cultural disturbances.

Furthermore, micro-artifacts in the sediment samples were variably distributed among trenches and loci. For example, the distribution of raw material types used in the construction of chipped stone tools varies among trenches. Operation G contained primarily dark brown, gray, and tan micro-debitage, while Operation A contained mostly white and tan debitage. This might suggest that toolkits varied in different areas of the site, possibly corresponding to social or economic distinctions as yet unclear.

Preliminary results

As noted above, a series of well preserved floors in Operation G were selected for intensive micro-debris sampling during the 2001 season. The horizontal expanse of each floor was gridded and sampled with precise notation of the location of each sample. In total, 89 samples were taken and analyzed in this manner from three separate loci: the western half of Room 3 (Locus G-061); the eastern half of Room 3 (Locus G-078) and the eastern end of Room 4 (Locus G-083). Each of the sediment samples was floated and micro-artifacts were removed from the heavy fractions. The distribution of the micro-artifact density was recorded and analyzed per sample. The results suggest differential activity areas within the rooms. In comparing the mean density of micro-artifacts per room, the highest, overall concentration of micro-ceramics and chipped stone debitage was found in G-061, while micro-bones were found in high numbers in G-078. These variable densities may correlate with a different set of regularly occurring activities in each room, or different parts of the same larger room.

Significantly, the micro-densities are not identical to the macro-densities. For the purposes of this study, a "macro" artifact is over $1cm^2$, a size regularly recovered with traditional trowelling and screening techniques. Importantly, chipped stone debitage was only visible at the micro-level. Large pieces of debitage would represent a clear hazard and were most likely removed after flint knapping activities. Similarly, micro-faunal remains were recovered from all of the samples while larger pieces of bone were recovered from only a handful of samples. The distribution of ceramic artifacts patterned differently, with more macro- than micro-sherds recovered. The differential patterning between micro and macro artifacts suggests that different post-depositional forces were at work within the trench based on size sorting. One of the tenants of micro-archaeology is that smaller artifacts are more likely to be overlooked and left *in situ*. If this is the case, an analysis of the micro-artifact densities is necessary in order to recover the activities conducted within the room originally.

Building on this premise, Fig. 15 maps the high and low density of micro-artifacts across a floor surface in the western half of Room 3. The lithic debitage is concentrated in the northeastern corner of the room. In contrast, the highest density of faunal debris is patterned along the northern wall. The small sherds are slightly more dispersed than either the lithics or bones, suggesting the occasional dropped vessel at various locations

throughout the room and subsequent attempts to sweep up the pieces.

Additionally, micro-artifacts can be sorted into qualitative categories including ceramicwares, burnt bones, rodent bones, and lithic raw material type. A preliminary comparison of the type of artifacts used in Locus G-061 to Locus G-078 shows that G-061 lacked micro-cooking wares and white micro-debitage, while G-078 lacked tan-debitage. Both rooms contained fine and sandy ware ceramics and a red/pink chipped stone. Micro-debris sampling is on-going at Ziyaret in order to sample a variety of domestic and public structures in order to compare and contrast this sort of room-signature across the site. The variable preference for chipped stone types may correlate with economic resources (if, for example, some of the types are not local) or household preferences. Whether there are qualitative differences among the raw material types remains to be seen. But even without clear structural differences, the use of certain material types may have had a symbolic meaning. For example, the singular concentration of tan debitage in G-061 may indicate a specific raw material type that was preferred for a certain activity or perhaps it represents a favored tool type by an individual. With a larger sample it will also be instructive to compare average densities of fine, sandy, cooking, and coarse wares among households. Likewise, the association of burnt micro-fauna and cooking wares in G-078 suggests food preparation. A small partition wall separated these two areas and perhaps the smaller space associated with G-078 was used to prepare food, while the larger, perhaps better lit room associated with G-061 was where the food was commonly consumed. At the same time, this suggestion does not require a simplistic division between a "kitchen" and a "dining room," which are modern and often exclusive categories that we would not expect to find in ancient cities.

Preliminary Assessment of Lithic Industry at Ziyaret Tepe

During the 2002 season, an initial assessment of the chipped stone industry was undertaken by Caroline Skelton, a student at the Institute of Archaeology, University of London. Lithics from the 2000 and 2001 seasons were washed, measured and entered into the database. Measurements for length, width and thickness, location and size (width and thickness) of butts or bulbs of percussion were made. A simple inventory of materials used: flint, obsidian or "other," the latter category denoting a range of materials, including an infrequent crystalline material used in lithic production at Ziyaret Tepe. The total number of lithic artifacts from the 2000 and 2001 seasons recorded was 648. Overall, the most common material used for chipped stone was flint (n=504), which represented 78% of the collection. A significant number of chipped stone artifacts (n=104, 16%) were of an unidentified stone, neither flint nor chert, while a small number were of the other crystalline stone (n=15, 2%) noted above. A systematic sampling of stone types for precise identification is underway at the University of Akron using exported stone samples. Finally, twenty-five artifacts representing 4% of the collection were made of

obsidian. While these numbers are taken from all excavated contexts, and therefore conflate chronological periods, they provide two immediate generalizations. First, the Ziyaret Tepe assemblage is numerically very small given the large areas excavated in the 2000 and 2001 seasons and, second, this is a flint-based industry with only a minor obsidian component.

Technologically, the majority of artifacts collected (n=369, 57%) were not worked, that is they had "natural" shapes and had probably been broken by plows or other accidents. The second largest category of material were "chunks" (n=216, 33%), pieces of stone that showed some human modifications but did not seem to have a bulb of percussion or any evidence of retouch. The remainder of the collection showed definite evidence of human activity, but was small in number and did not form a clear type series based on the current sample. This group included: flakes or pieces of flakes with a discernable bulb of percussion (n=44, 7%), cores (n=10, 2%), blades (n=7, 1%) and tools (n=2, <1%). The spatial distribution of this latter category has only been preliminarily studied, but it is of interest that 41 artifacts (65%) came from Operation A and 16 artifacts (25%) came from Operation E, while the other five Operations excavated in 2000-2001 (Operations B, C, D, G and I) only accounted for six artifacts (10%) of the worked assemblage. The conclusion drawn from this preliminary assessment is that there is no evidence for significant flint tool production from any of the excavated Late Assyrian levels, nor from the second millennium contexts in the Operation E step trench. Indeed it is likely that the lithics recovered from these layers were derived from the earlier deposits.

Magnetic Field Gradiometry Survey

The placement of excavation trenches at Ziyaret Tepe has largely been guided by the results of subsurface magnetic field gradiometry surveys. Two initial field seasons of subsurface magnetic field gradiometry were carried out in 1998 and 1999 at Ziyaret Tepe (Matney and Somers 1999; Matney and Bauer 2000). The purpose of those surveys was to test the efficacy of using magnetic survey techniques at Ziyaret Tepe. Favorable results were obtained, as reported previously, and it was decided that a total survey of the site would be conducted, starting in 2002 and continuing for several seasons. In 2002, an University of Akron archaeological geophysics team conducted survey in two portions of the site: the western high mound and the western lower town [see Fig. 2 for the location of these survey areas]. These areas were chosen for several reasons. In the high mound, extensive excavations on the eastern edge of the site in Operations A and E have begun to clarify the nature of remains in that area. In contrast, the western side of the high mound is still not well understood. In anticipation of starting excavation in this area of the high mound in a future season, it was decided to re-survey that portion of the western high mound we examined in 1998, and to complete a survey of the entire western sector.

Fieldwork this season was conducted with GeoScan FM-36 fluxgate gradiometer at an ideal sample density of 8 samples per meter, over one meter transects. At the beginning of the season, we experimented with lower and higher sampling densities (the latter achieved with narrower transects) and found a density that was a reasonable compromise between speed and resolution. Data were collected in 20m by 20m grids using a zig-zag collection path. The gradiometer required frequent rebalancing as the intense summer heat caused a significant change in temperature during the working day. Two students, Ms. Ann Donkin and Ms. Lauralee Elliott, were responsible for day-to-day data collection. Data were downloaded into a laptop computer and initial processing and filtering was accomplished using GeoPlot 3.0, a proprietary software package designed for use with the FM-36. Noise was removed using a variety of filtering techniques, and composites were created for each large survey area.

Preliminary results of the gradiometry surveys

On the high mound, the results were disappointing, due in part to later material sitting on top of the Late Assyrian architecture and in part to a large metal irrigation pipe that was laid across the high mound by a local villager in order to provide water to an adjacent cotton field. The results of the 2002 survey in the upper high mound are shown in Fig. 16. The irrigation pipe, seen clearly as an alternating band of very strong positive and negative values, obscures all magnetometry data for 10-12 meters on either side, making survey of the mound adjacent to the pipe impossible. As one moves away from the pipeline, the results are still difficult to decipher, with one exception. At the southern edge of the high mound, a series of weakly magnetic, parallel linear features run northwest to southeast. These features are at the edge of the tell where, in a small cut made by a modern track, we can observe what looks like a stone paving or wall foundations eroding out of the mound. These linear features are in the right place for a possible citadel wall, but this will have to be investigated through excavation. In the other trenches on the edge of the high mound (Operations A, C and E) no evidence for such a wall has yet been found. Unfortunately, even at high sample densities, the nature of the architecture and the thickness of the overburden elsewhere on the western high mound left us with unsatisfactory results in 2002. Our results are only based on preliminary data processing, and work continues with filtering the datasets to suppress the noise of the irrigation pipe and to enhance the weak magnetic signals characteristic of the high mound at Ziyaret Tepe.

Results from the magnetic gradiometry survey in the western portion of the lower town were very good. Fig. 17 presents one processed view of the lower town dataset. Along the northern edge of the plan, a sharp line with adjacent high positive and negative readings marks the beginning of the slope of the tell. A similar curving line at the extreme southwestern corner of the map also marks the top of the mound's slope. Finally, a regularly spaced set of strong dipoles along the eastern edge of the map is the metal

survey stakes for the Operation G excavations. All other features shown on this map are the result of subsurface anomalies. From past experience at Ziyaret Tepe and ground truthing via excavation, we know that the long weakly negative features are probably mud-brick walls and that large very strong bipolar features are kilns.

The most striking feature of this gradiometry map are the long parallel linear features that run from the northwestern corner of the site down the entire length of the western edge of the settlement; these make a sharp jog at the southern edge of the survey area, before turning generally to the west. This marks the line of the city's ancient fortification wall that we are now able to trace for 200m in this survey. It is interesting to note that the wall does not appear as a strong feature along the northern edge of the survey area. This suggests that the city wall may be cut here, possibly by the erosion of this lobe of the lower town that is raised at least 6m above the floodplain to the north. The implication of this observation is that the walled city continued further to the north and was probably larger than the 32 hectares that has been previously calculated.

Another significant discovery this season was possible gradiometry evidence of a large building located at the "jog" in the city wall. Here we see clear linear features, with a negative magnetic gradient. This type of signal is similar to that which marked the presence of the large mud-brick building with a checkerboard mosaic floor in Operation G (Matney et al. 2002). In this case, the lines of most of the excavated walls were seen as faint negative features. Moderately strong positive features, usually a meter or so across turned out to be complete storage vessels that were still *in situ* less than 50cm below the modern surface. If this interpretation is correct, then there is an apparently well preserved monumental building to the south of our current Operation G trenches, at or near the city wall.

Regional Geomorphological Field Survey

A major new initiative associated with the Ziyaret Tepe archaeological project was the start of a multidisciplinary study of the local geomorphologic setting of the Upper Tigris River valley. This field survey was directed by Dr. Kathleen Nicoll of the University of Oxford. Other participants in the field party included Mr. Brian Pittman (University of Cambridge) and Mr. Andrew Bauer (University of Chicago). The long-term goal of the geomorphological project is to decipher the local paleoenvironmental setting of human activities from the Paleolithic through the Iron Age in this region of Turkey. The primary objectives in the initial 2002 field season included the following: (1) to initiate geoarchaeological description of the region; (2) to document the local stratigraphy, and sample appropriate locations for further detailed chronometric and paleoenvironmental analyses that will complement the ongoing excavations at Ziyaret Tepe; and (3) to develop an accurate set of basemaps that can be comprehensively rendered into a Geographic Information Systems (GIS) database to serve as the basis for

further research.

To facilitate our initial regional survey, we utilized digitally-processed multiband ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) satellite images of the area around Ziyaret Tepe and the Upper Tigris River Valley. ASTER datasets have been effectively used in a variety of landscape studies to map rock types, as well as to delineate soils and other surface features (Yamaguchi et al. 2001). The synoptic view provided by the satellite image oriented our mapping efforts in the field; the satellite data comprise one layer in our GIS of the region.

Aided by the satellite imagery, we used vehicular and pedestrian surveys to identify suitable locations where we could describe and sample stratigraphic sections. After reconnaissance, we employed Global Positioning Systems (GPS) and a laser theodolite Electronic Distance Meter (EDM) to "ground-truth" (i.e. georeference) specific modern cultural sites and local geographical and archaeological features. These data points were then referenced geographically with available published 1:100000 and 1:25000 topographical maps. Primary base maps are currently under construction to depict the observed distribution of the fluvial, lacustrine, and soil deposits based upon cross-cutting relationships, as well as differences in spectral signatures due to sediment type, drainage characteristics, and vegetative cover.

Along its reach near Ziyaret Tepe, the Upper Tigris river valley preserves a record of changing climatic conditions over late Quaternary time scales. Its variations in base flow, flood magnitude/frequency, and sediment transport can be discerned in the channel and floodplain morphology, and the sediments that form terraces along the river and its tributaries. To reconstruct the magnitude and timing of these changes, we are interpreting the local stratigraphic record and its proxy paleoenvironmental data (e.g. pollen and phytoliths).

Fig. 1 depicts a subset of our study area in the region of Ziyaret Tepe, and some areas in which we conducted detailed stratigraphic descriptions and systematically sampled sediments for further laboratory analyses. Fig. 18 presents the transect lines of geomorphic cross-section as shown in Fig. 1; the modern floodplain is annotated as T-0 (Terrace 0), with subsequently older terraces annotated as T-1, T-2, and so on. Some of these terraces are as much as 7m above the modern floodplain (i.e. the T-0 surface); these are massively thick gravel sequences attesting to former periods of base flow that far exceed the modern discharge of the river.

In the post-field season, we are conducting various laboratory analyses of our collected samples. The main analytical techniques we plan to employ include: (1) mineralogical assessment of sediments via thin section microscopy, chemical techniques, and x-ray determination; (2) absolute age determination via radiocarbon analyses and optically stimulated luminescence (OSL); and (3) determination of paleoecological context via soil description and micromorphology, and botanical microfossil (e.g. pollen and phytolith) analyses. The objectives of these analyses are to: establish a benchmark

framework that we can test and expand upon within the Upper Tigris watershed during future field seasons; provide the empirical basis for understanding the frequency, magnitude, and thresholds for changes in the fluvial system; and compartmentalize the fluvial record so as we can then evaluate climatic changes through time, and in the context of local archaeological developments.

Our ongoing studies will help reconstruct the former vegetative habitat in the Ziyaret Tepe region, and provide another context through which we can decipher the paleoenvironmental context of the Upper Tigris region as it relates to cultural activity along Assyria's Anatolian frontier (*sensu* Parker 2002). Forthcoming results will help place the local culture within a clear geographical, environmental and ecological setting, enabling us to document the diachronic evolution of the social and natural environments during an historically documented period of rapid urbanization along the Upper Tigris River valley (Matney 1998; Matney et al. 2002). Paleoenvironmental records from this understudied part of southeastern Anatolia will comprise a new dataset that can test the validity of recent claims regarding the historical significance of abrupt aridification during the Early Bronze Age (the end of the third millennium BC) and the consequent effects on the northern reaches of the ancient Near East (see Fontugne et al. 1999; Miller Rosen 1998; Wilkinson 1999; Weiss 2000). The records from the Ziyaret Tepe reach of the Tigris will provide a valuable basis for comparison to other geoarchaeological studies available from the well-documented Euphrates River basin, further deepening our window into antiquity (e.g. see Wilkinson 1978; Roberts 1991; Miller Rosen 1997; Roberts and Eastwood 1997; Wilkinson 1999).

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APPENDIX A. Catalogue of Ceramic Plates

1. ZT 3303/1 (E-071).Small carinated bowl, distorted and irregular, rim oval. Drawn both at its widest and narrowest extent. Ht. 10. Rim diameter 10.6-12.4 (100%). Base diameter 3.3 (100%). Complete, but broken into many small pieces. Inclusions: common fine black mineral, occasional medium white mineral and common fine mica. Munsell Color external and internal surfaces: 7.5YR 8/4 pink. Paste: 5YR 7/6 reddish yellow varies to 10YR 8/3 very pale brown.

2. ZT 3266/1 (joins 3277/1, 3236/1, 3266/ also possibly the same vessel as 3277/2) (E-071). Rim of deep carinated bowl with ridge above carination. Rim diameter 21 (40 + 15 %). Inclusions: common fine white mineral and occasional fine black mineral, common fine veg. Surface treatment: wet smoothed. Munsell Color external surface: 5YR 8/3 pink to 7/3 pink. Internal surface: 2.5YR 6/6 light red. Paste: varies 7.5YR 8/4 pink to 7/4 pink. (3236/1 is part of the same vessel but burnt very black (10YR 3/1 very dark grey) and has acquired a shiny deposit on the surface that gives the sherd the impression of being burnished, the 'burnishing' is totally absent from the joining 3266/1 sherd and therefore probably a product of the conflagration.) 3277/2 may be part of the same vessel but does not join. External surface: 7.5YR 7/4 pink. Interior surface: 5YR 6/4 light reddish brown to 6/6 reddish yellow.

3. ZT 3291/1 (E-071). Deep carinated bowl. Rim diameter 29 (16%). Inclusions: common fine black mineral and mica and occasional fine white mineral, common fine veg. Surface treatment: wet smoothed exterior. Munsell Color external surface: 7.5YR 8/2 pinkish white to 8/4 pink. Internal surface: 5YR 7/4 pink to 2.5YR 5/6 yellowish red to 5YR 6/6 reddish yellow. Paste: 5YR 7/4 pink.

4. ZT 3236/5 (E-071). Painted body sherd from a deep carinated bowl with ridge on shoulder. Painted band below ridge and diagonal lines making alternating triangles. Plaster baked onto surface including the sherd's broken edges suggesting that the sherd was already broken before the fire and may have been within the roof construction. Diameter at carination approx. 28. Inclusions: common fine black mineral and occasional fine veg. Surface treatment: wet smoothed. Munsell Color external surface: 10YR 8/3 very pale brown. Internal surface: 7.5YR 6/4 light brown. Paste: 5YR 6/3 light reddish brown. Paint: 5YR 5/1 grey.

5. ZT 3291/2 (joins ZT 3266/, ZT 3277/)(E-071). Deep carinated bowl, base missing. Very little of the body below the carination is extant. Interior surface red and flaking. Ext. Ht. 18.5. Rim diameter 25 (48%). Inclusions: common fine white mineral, occasional fine black mineral, sparse medium and coarse white mineral, sparse fine veg. Surface treatment: wet smoothed. Munsell Color external surface: 5YR 7/4 pink to 7.5YR 8/4 pink. Internal surface: 2.5YR 6/4 light reddish brown. Paste: 7.5YR 7/4 pink to 7.5YR 8/4 pink

6. ZT 3305/1 (E-071). Deep carinated bowl, complete but base worn very thin and interior surface flaking. Ht 17. Rim diameter 21-22.8 oval (100%). Base diameter 10 (100%). Inclusions: abundant fine white mineral and sparse coarse white mineral, sparse fine mica and sparse fine veg. Munsell Color external surface: 2.5Y 8/3 pale yellow to 5YR 7/4 pink. Internal surface: 10R 5/6 red. Paste: 7.5YR 8/4 pink.

7. ZT 3236/4 (E-071). Ring base. Base diameter 13.4 (100%). Inclusions: occasional fine black and white mineral and mica and visible on base interior only, common fine veg, occasional medium veg. and sparse course veg. Surface treatment: wet smoothed, exterior also seems to be stained. Munsell Color external surface: 7.5YR 6/2 pinkish grey. Internal surface and paste: 7.5YR 7/4 pink.

8. ZT 3266/2 (joins 3277/3) (E-071). Disc base. Interior surface red and flaking, baked plaster on exterior

surface, old breaks with worn edges. Base diameter 9 (80%). Inclusions: common fine white mineral and sparse coarse white mineral, occasional fine mica and fine veg. Munsell Color external surface: 5YR 7/4 pink. Internal surface: 10YR 5/6 yellowish brown. Paste: varies 2.5 YR 6/8 light red to 10YR 8/3 very pale brown .

9. ZT 3311/1 (E-071). Complete section of a ring base bowl, about half of the vessel is extant. Ht. 4.9. Rim diameter 17.5 (58% extant). Base diameter: 7 (10%). The interior of the base is stained pink ?by the combustion of its contents or something that it came into contact with at the time of burning. Inclusions: occasional fine black and white mineral, sparse coarse white mineral, occasional fine and sparse medium veg. Surface treatment: wet smoothed. Munsell Color external surface: 2.5Y 8/2 pale yellow. Internal surface: 2.5YR 6/4 light reddish brown (stain). Paste: 5Y 8/2 pale yellow.

10. ZT 3170/1 (E-071). Exact position N1085 E1199. Carinated bowl with out-turned rim and flat base. Somewhat irregular in shape, reddish signs of burning on the exterior and patches of baked plaster, found in close association with the roofing collapse. Ht. 8. Rim diameter 22-24 (45 %). Base diameter: 7 (40%). Inclusions: common fine white mineral and sparse medium white mineral, occasional fine veg. Surface treatment: wet smoothed. Munsell Color external surface: 5YR 8/1 white. Internal surface: 5YR 8/1 white. Paste: 5YR 6/4 light reddish brown.

11. ZT 3255/1 (joins 3266/4) (E-071). Large bowl with rolled/out-turned rim, 2 opposing lugs and an equidistant spout on rim, flat base. The fabric of this bowl is much grittier than most of the rest of the vessels and sherds in this deposit. Ht 12. Rim diameter 32-33.5 (100%). Base diameter 8.8 (100%). Although both rim and base are complete there are a couple of body sherds missing in between. In general the base is greener and grittier, while towards the rim the color is more yellow and pink. Inclusions: common fine and medium white mineral, common fine black mineral and occasional medium black mineral. Surface treatment: wet smoothed. Munsell Color external surface: 2.5Y 8/4 pale yellow. Internal surface: 2.5Y 8/4 pale yellow. Paste: 5YR 7/4 pink to 7.5YR 8/4 pink to 5Y 8/3 pink.

12. ZT 3236/3 (joins sherd ZT 3266/8) (E-071). Medium jar rim. The yellowish exterior, pinkish interior is common on many of the sherds in this deposit and an effect of the burning. Rim diameter 17 (25%). Inclusions: common fine black and white mineral and sparse medium white mineral, occasional fine mica and occasional fine veg. Surface treatment: wet smoothed. Munsell Color external surface: 2.5Y 8/3 pale yellow. Internal surface:2.5YR 6/4 light reddish brown. Paste: 5YR 7/6 reddish yellow.

13. ZT 3266/6 (E-071). Jar rim, rolled rim, sloping neck and ridge on shoulder. Baked plaster on exterior surface. with Rim diameter 19 (60%). Inclusions: occasional fine white mineral and sparse fine veg. Surface treatment: wet smoothed. Munsell Color external surface: 10YR 7/3 very pale brown. Internal surface: 10YR 7/4 very pale brown. Paste: 2.5Y 3/1 very dark grey.

14. ZT 3266/7 (joins ZT 3310/1) (E-071). Rolled jar rim. Rim diameter 26.5-28 (57% total of rim extant and ten body sherds from this jar). Inclusions: common fine and medium black and white mineral, occasional coarse black and white mineral. Surface: wet smoothed, trickles of red ?staining running down the vessel from the rim. Color ext. surface:7.5 YR 7/4 pink. Internal surface: 10YR 7/6 yellow. Paste: 7.5YR 7/4 pink varies to 6/4 light brown.

15. ZT 3277/4 (E-071). Bowl rim with much baked plaster on the surface, interior surface very worn, despite the poor visibility it seems to have either a brown wash on the exterior and/or is burnished. Rim

diameter 30-31 (9%). Inclusions: occasional fine black and white mineral occasional fine mica and occasional medium veg. Munsell Color external & internal surfaces and paste: 7.5YR 6/4 light brown. Core: 10YR 5/2 greyish brown.

16. ZT 3236/2 (E-071). Painted body sherd with bands and eye motifs, baked plaster on surface of sherd. Inclusions: common fine black mineral. Munsell Color, external surface: 7.5YR 8/4 pink. Internal surface and paste: 7.5YR 7/4 pink. Paint: 5YR 5/3 reddish brown to 7.5YR 7/4 pink.

17. ZT 3196/1 (E-061). Painted body sherd from deep carinated bowl with ridge on shoulder. Painted bands and diagonal lines. Inclusions: occasional fine black and white mineral and mica and common fine veg. Munsell Color, external surface: 2.5Y 7/3 pale yellow. Internal surface: 7.5YR 6/4 light brown and paste 7.5YR 6/6 reddish yellow. Paint: 5YR 5/4 reddish brown. Surfaces obscured by baked plaster.

18. ZT 3194/1 (E-061). Painted body sherd, probably a jar shoulder. Wet smoothed surface. The orientation is problematic, that shown on the illustration is taken from the wheel/wipe marks on the reverse, however the wipe marks on the exterior would suggest a horizontal band at the top with vertical and horizontal cross hatching. Inclusions: common fine black mineral, occasional fine mica and sparse fine veg. Munsell Color, external surface: 10YR 8/4 very pale brown. Internal surface: 10YR 7/4 very pale brown and paste 7.5YR 6/4 light brown. Paint: 5YR 6/3 light reddish brown.

19. ZT 3205 (E-061). Cooking pot, almost complete but fabric friable and joins difficult to make, base rounded. Rim diameter 21 (75%). Surface: wet smoothed and burnished. Inclusions: common fine, medium and course black and white mineral and occasional fine mica. Munsell Color, external and internal surfaces: 10YR 7/3 very pale brown. Paste: 10YR 7/4 very pale brown, with greyish core (not Munselled).

20. ZT 3194/2 (E-061). Lid fragment, covered in baked plaster, visibility of surface and fabric very poor. Two shallow grooves on surface. Diameter 20 (20%). Munsell, paste: 5YR 7/6 reddish yellow.

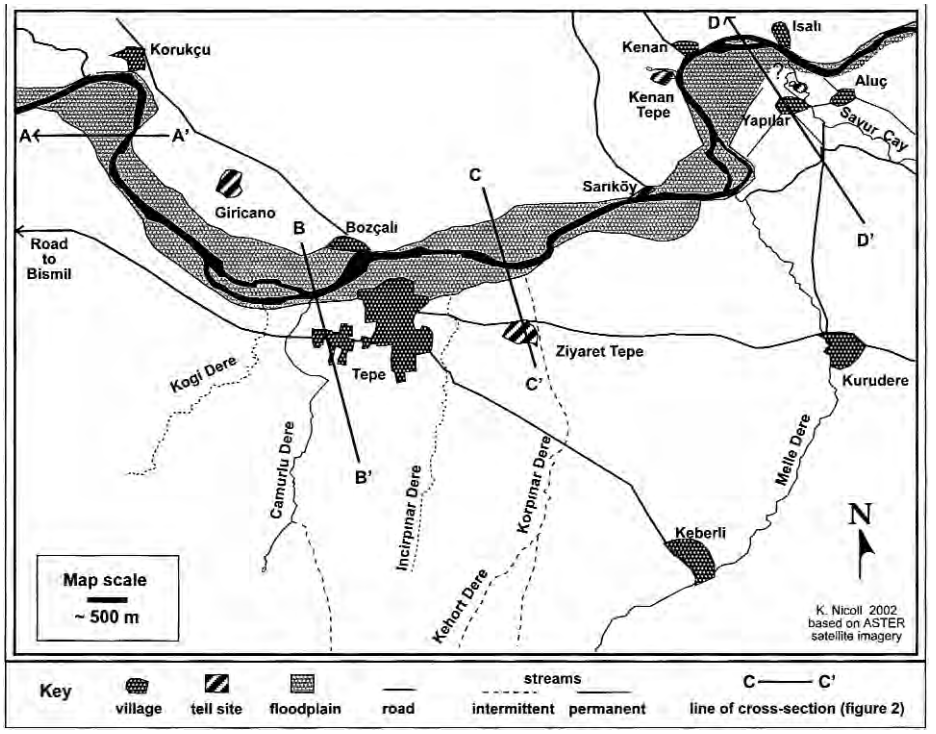


Figure 1. Map showing the location of Ziyaret Tepe, its location relative to recent sedimentation of the Tigris River and the location of stratigraphic sections.

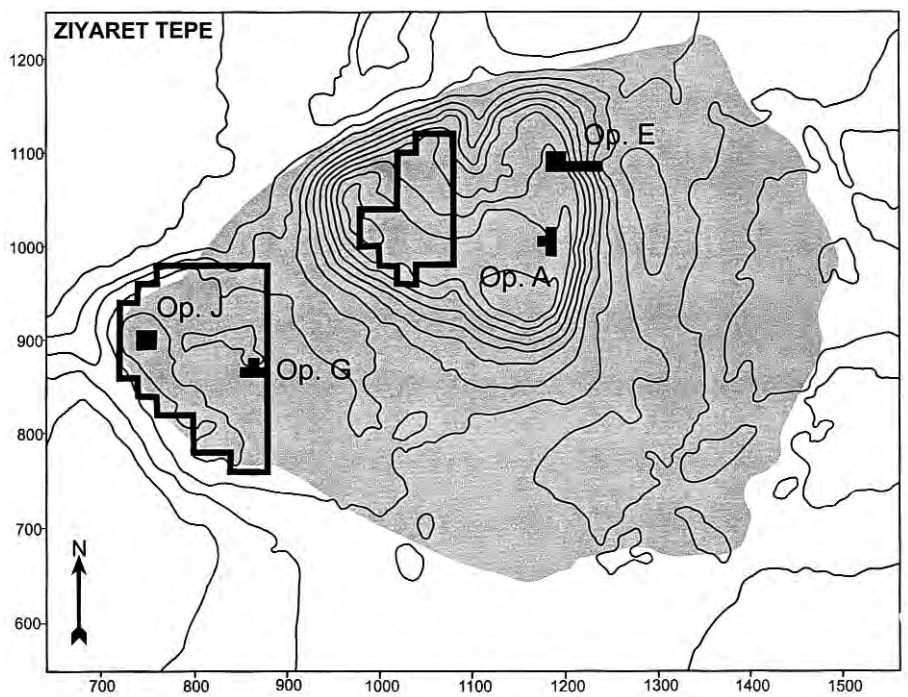
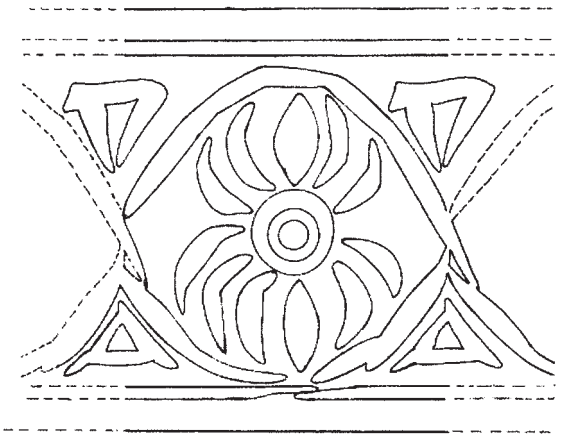


Figure 2. Topographic plan of Ziyaret Tepe showing the location of excavation and geophysical survey units in 2002.

Figure 3. Photograph of Middle Assyrian deposits at the top of Operation E.



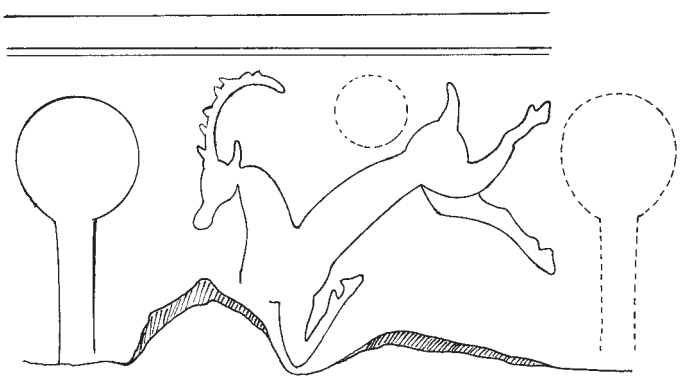


Figure 4. Cylinder Seals from Operation E
(top and photograph: ZT 3635, E-323; bottom: ZT 6545, E-244)

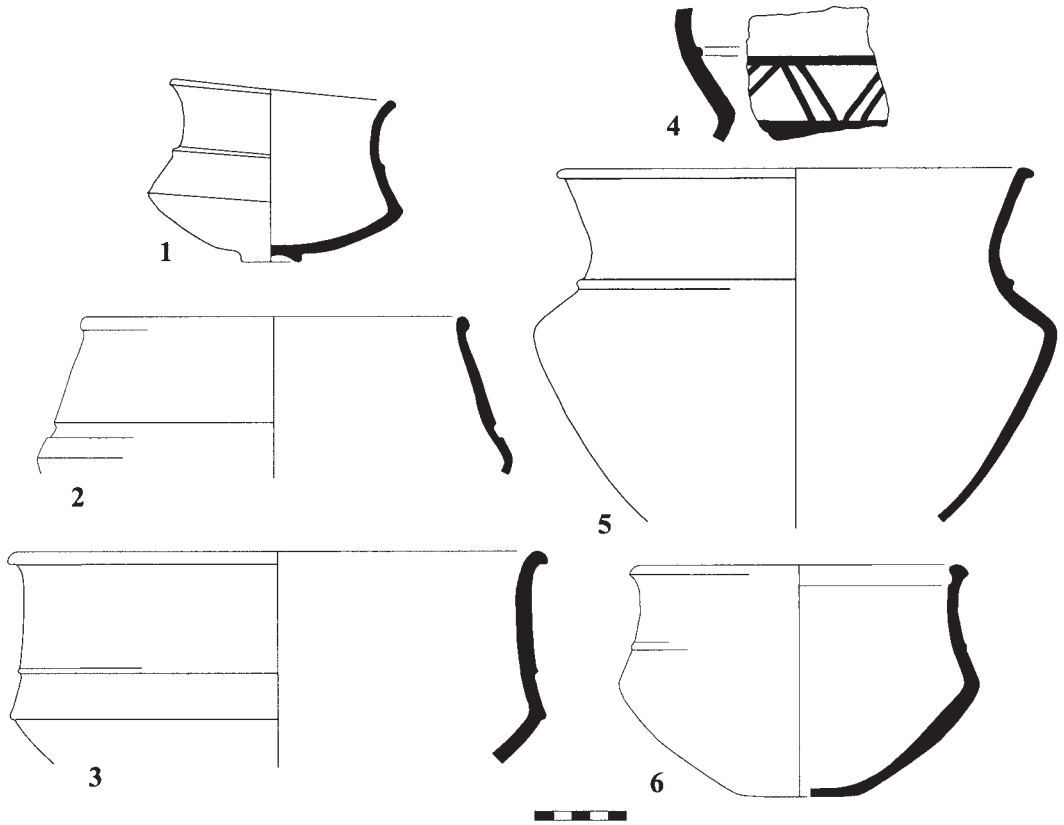


Figure 5. Pottery from the Brightly Burned Building

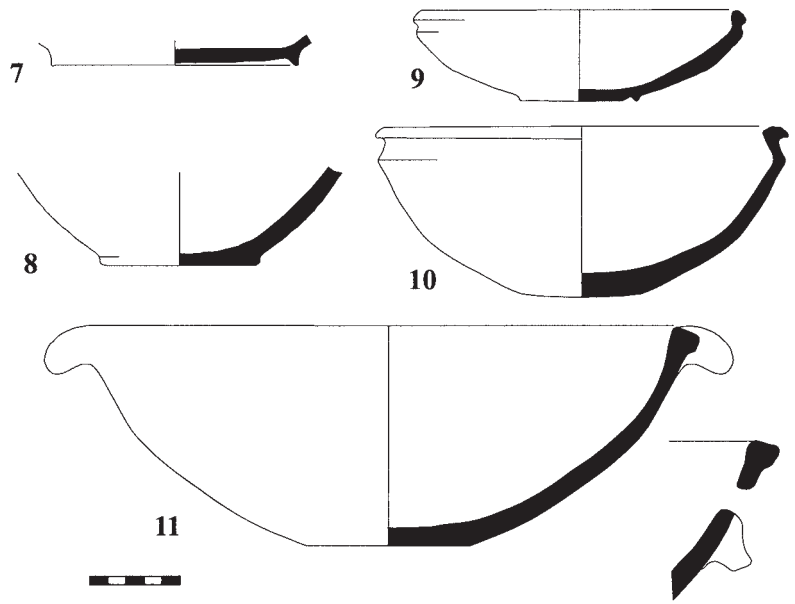


Figure 6. Pottery from the Brightly Burned Building

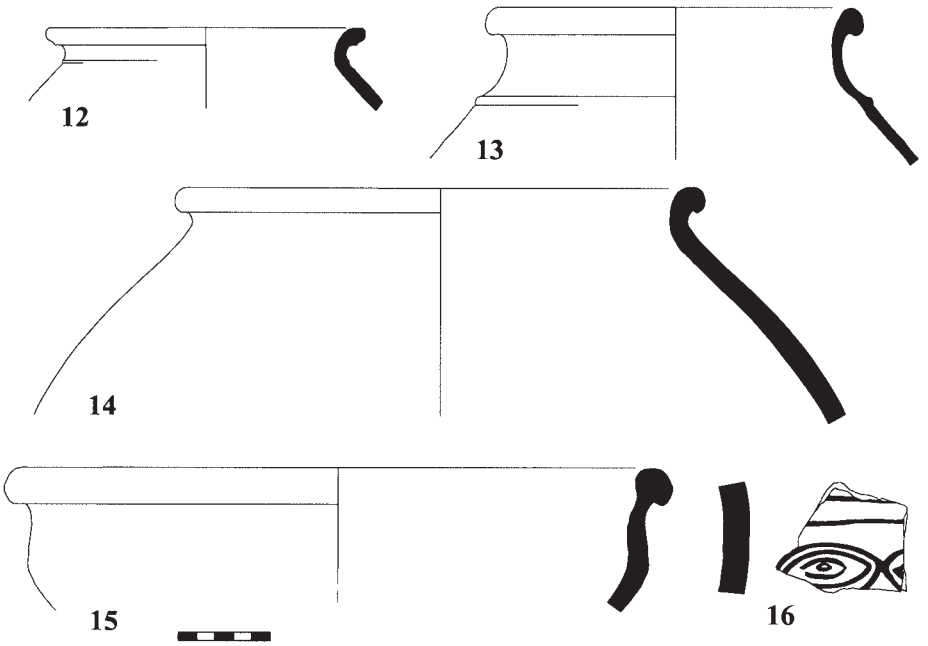


Figure 7. Pottery from the Brightly Burned Building

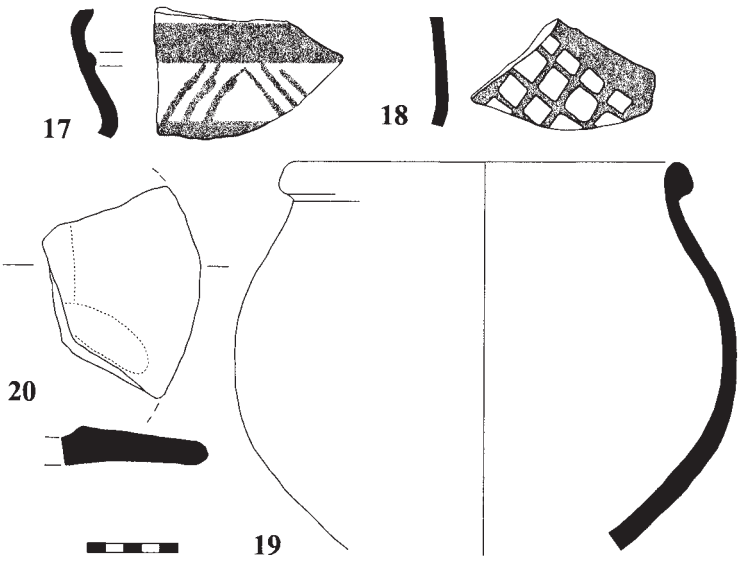


Figure 8. Pottery from the Brightly Burned Building

Figure 9. Photograph of excavations in Operation A showing mudbrick walls cut into platform and extensive later pitting.

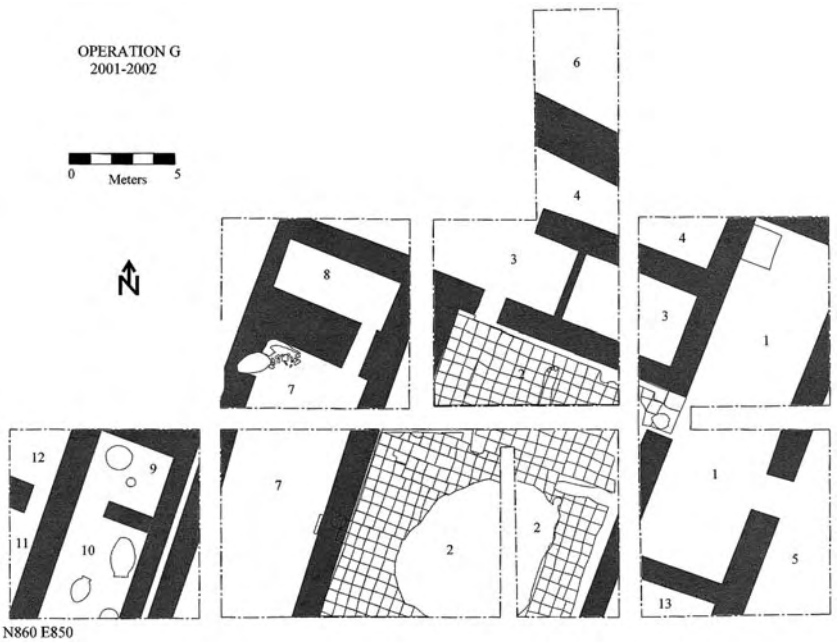


Figure 10. Plan of the architectural remains in Operation G, showing the location of the mosaic floors.

Figure 11. Photograph of the rooms in which the tablets were found in Operation G (Rooms 9 and 10)

Figure 12. Photograph of unbaket clay tokens from Rooms 9 and 10 in Operation G.

Figure 13. Photograph of tablets from Operatoin G after firing.

Figure 14. Photograph showing the construction of the Operation J walls reusing Roman roof tiles.

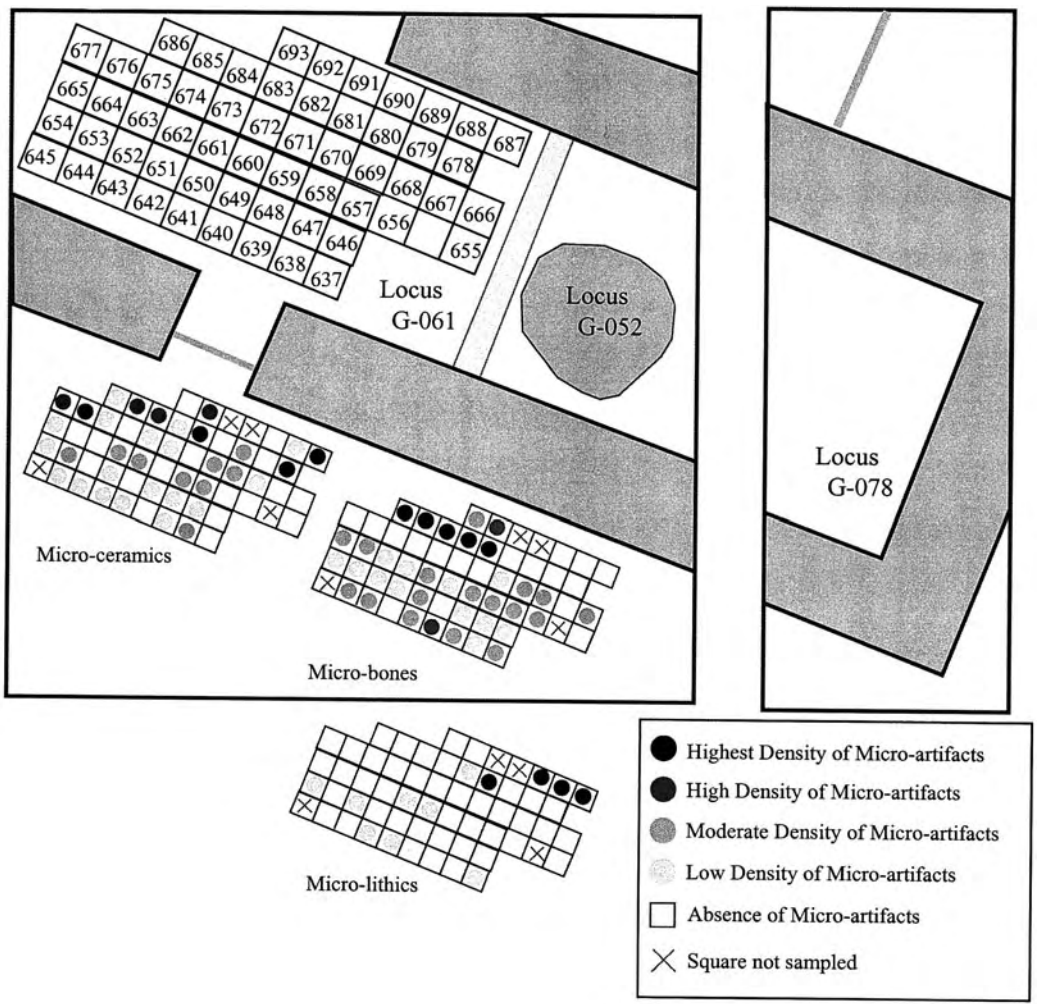


Figure 15. Map showing the distribution of micro-debris from Operation G building.

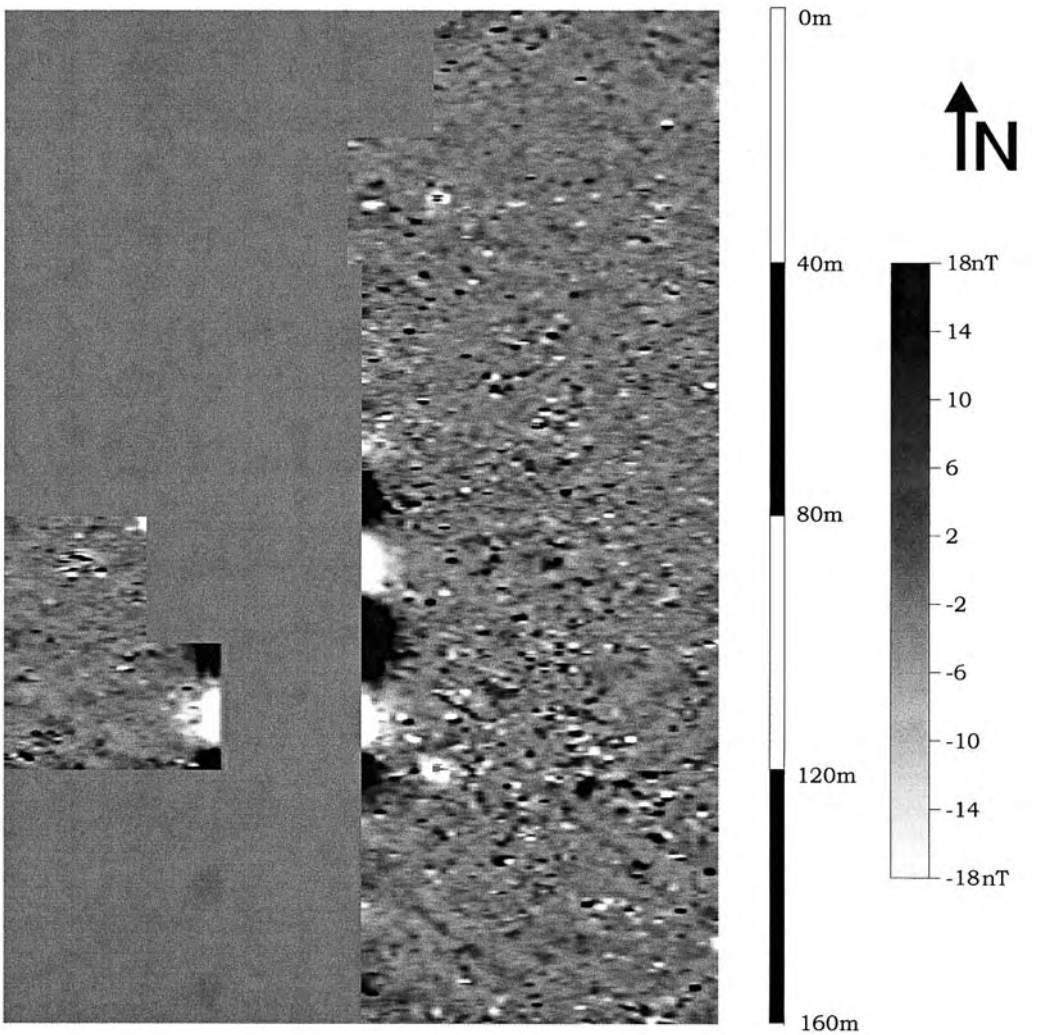


Figure 16. Magnetic field gradiometry map showing the results of survey in the western portion of the high mound.

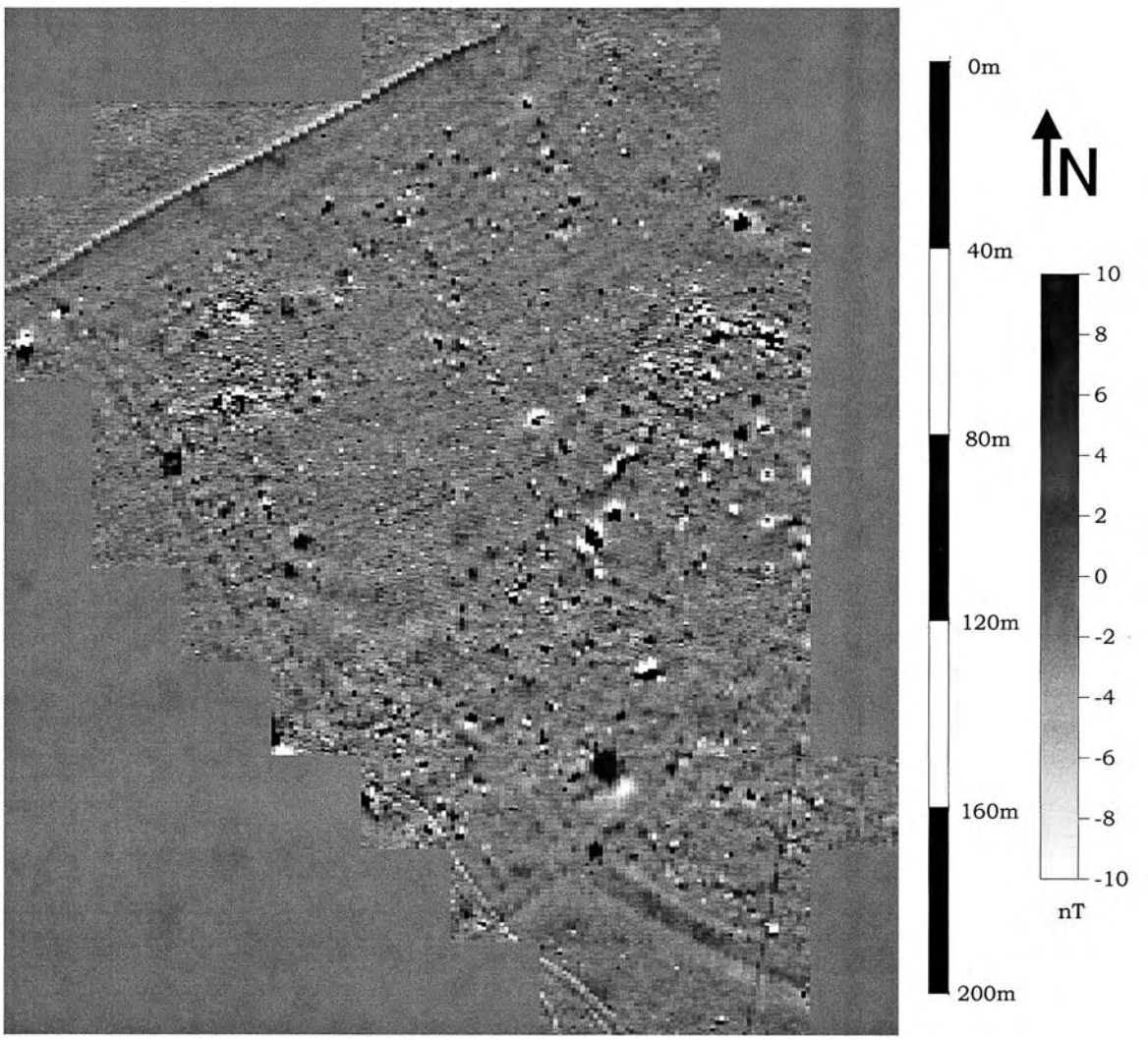


Figure 17. Magnetic field gradiometry map showing the results of survey on the western lobe of the lower town.

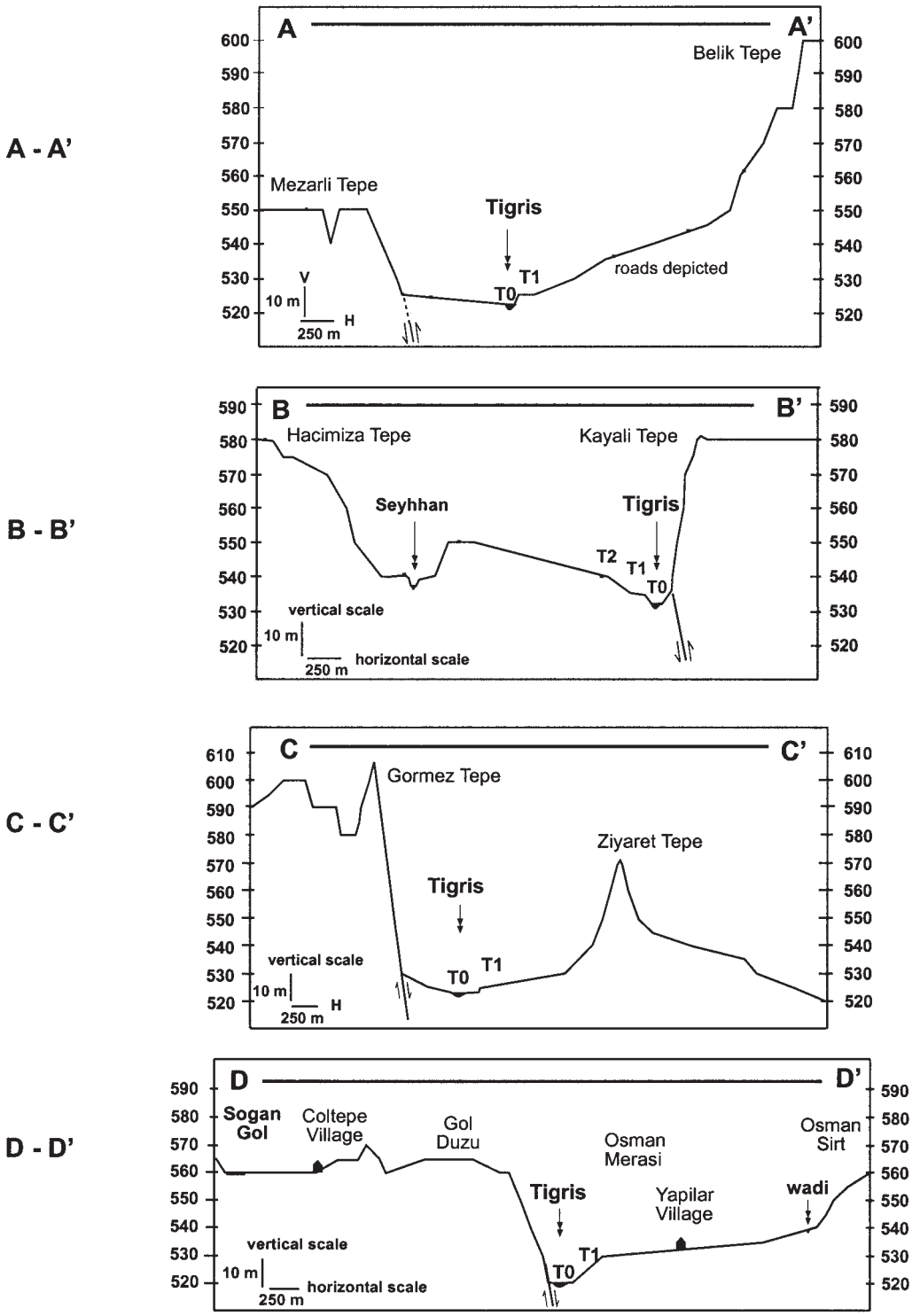


Figure 18. Cross-sections depicting the modern topography of the Tigris River near Ziyaret Tepe.